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CLOSING OF TUBERCULOUS LUNG CAVITIES BY INTRAPLEURAL PNEUMOLYSIS*

BY GEORGE L. STIVERS, M.D.†

MY selection of this topic, "Closing of Tuberculous Cavities," is to stimulate more active interest in the early surgical treatment of pulmonary tuberculosis by the use of intrapleural pneumolysis.

There are various methods of treatment that must be considered in every case of pulmonary tuberculosis. Many physicians advise bed rest in the sunshine and the open air, others advocate increasing amounts of tuberculin. Special diets, cod liver oil, increase of certain vitamines and sanocrysin injections have many supporters. The treatment now giving the best promise of success is surgical compression of the lung or collapse of the chest wall.

The rest treatment has been productive of marked beneficial results, but there is only relative rest of the lungs. A new surgical technique has been developed to bring about more complete rest of the diseased lung, and chest surgery by its various methods of compressing the lung and producing physiological rest supplements the rest cure of the body.

Chest surgery will meet with some opposition, just as other operative procedures of 10 to 20 years ago were met, at first, with indifference. I believe that the brilliant achievements of Archibald, Alexander, Churchill, Matson, Wells and Whittemore in chest surgery stand out so vividly that it is unnecessary to consider it in an experimental field. Phrenicectomy, artificial pneumothorax, intrapleural and extrapleural pneumolysis and thoracoplasty are surgical procedures in pulmonary tuberculosis that are shortening the course of the disease from years to weeks and eliminating a constant menace to family and friends of the patient and returning a useful individual to active normal life.

Artificial pneumothorax is a minor surgical procedure of compressing the diseased areas or cavities in the lung by the introduction of air into the pleural space. The technique of inducing artificial pneumothorax must be carried out with observance of strict aseptic methods. When artificial pneumothorax is successfully produced in pulmonary tuberculosis, it is a means of permanently effecting a cure. In some cases adhesions holding portions of the lung to the chest wall prevent satisfactory collapse of diseased lung tissue. The relief of clinical symptoms is quite possible even with a partial pneumothorax but the end results are far from satisfactory. If complete collapse is obtained and continued without complications, perfect rest for the lung is realized, symptoms are rapidly relieved, the disease in the infected lung is arrested and a useful citizen is returned to the community. If fibrous bands hold the lung cavities open, additional measures of compression must be instituted in order to accomplish the desired result and pneumolysis is considered a proper surgical procedure.

There are two types of operations for the removal of adhesions. The open pneumolysis, with resection of portions of ribs, is the selected operation in exceptional cases, where the adhesions are extensive and where cauterization by the closed method would be dangerous to lung tissue or blood vessels. The closed intrapleural pneumolysis which is performed through a small punctured wound in the chest wall, is the operation of preference in most cases and is the one which will be described.

As a preliminary to intrapleural pneumolysis, the bleeding time, clotting time and blood grouping are always obtained in preparation for emergencies which we hope will not occur.

In preparing a patient for pneumolysis, luminal given 12 hours before operation in divided doses totaling 9 or 12 grains, is sufficient to obtain a very coöperative patient and then a local anesthetic injected into the skin and subcutaneous tissue, relieves all pain of operation. In exceptional cases where the cautery is used to peel the band from the parietal pleura, it is often necessary to inject additional anesthetic at the insertion of the adhesion on the chest wall in order to complete the cauterization without excessive pain.

The head of the operating table is raised so that the patient assumes a semi-upright position for the operation, with arm on the operative side forcibly extended above the head. This enables the operator to introduce the thoracoscope high up in the chest wall under the scapula and

*Read before the Worcester County Medical Society, Worcester, Mass., September 14, 1932, and the American Sanatorium Association at Waltham, Mass., October 14, 1932.

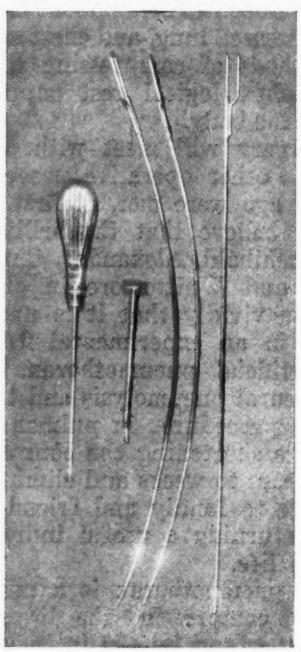
†Stivers — Medical Director, Belmont Hospital, Worcester, Mass. For record and address of author see "This Week's Issue," page 504.

thereby obtain a much better view of adhesions when operating in the upper part of the thoracic cavity. Serous exudate does not interfere with the field of operation when the patient assumes

this semi-upright position and it is certainly more comfortable for the operator who must change his position quite frequently. Iodine and alcohol preparation includes the entire hemithorax and the arm to the wrist, for manipulation of the extended arm is sometimes necessary.

The Jacobaeus Unverricht thoracoscope is the instrument used and a clear view of all parts of the pleural space can be obtained with very little difficulty. The thoracoscope is usually introduced at the sixth or seventh intercostal space about three inches from the spinous processes. The accompanying cautery, used at a dull red glow, is inserted through the chest wall at a place varying according to the location of the bands to be cut. The third interspace in the anterior axillary line is a favorite location.

One cannot be successful in every case of intrapleural pneumolysis and it is impossible to



determine by x-ray or physical examination the amount of cauterization that can be accomplished until the thoracoscope is introduced into the chest cavity and actual conditions within the thorax are seen. It is a difficult problem at first inspection of the chest cavity to determine the number and location of the adhesions, but by cutting one adhesion that is clearly seen and allowing the lung structure to sag or collapse,

other adhesions are likely to come into view and the operation can be continued as in the first band severed. In this way I have cauterized five bands when at the first view of the thoracic cavity, only one was discovered by the thoracoscope.

There are three varieties of bands usually observed through the thoracoscope which can be destroyed if they are not complicated by blood vessels, lung tissue, caseous nodes or by extension of cavity formation into the bands.

First, there are string-like bands, small in diameter and varying considerably in length from one-half inch to over five inches, white and shiny in color and devoid of blood vessels or lung tissue. After cauterizing they contract readily, allowing the lung to collapse. These bands are most often located in the lower two-thirds of the chest cavity and are quite easily diagnosed on the x-ray films as to location but not always as to size. I believe this variety to be the most frequent band seen at operation.

Secondly, there is the heavy, markedly fibrous band, round and short, which usually contains lung tissue to within a short distance of its insertion into the chest wall. A cavity in the lung is often its origin. This may be white, gray or dark purple, and one-half to one inch or more in diameter. It often contains many small blood vessels which do not seem to extend much beyond the lung tissue and are seldom apparent in the end attached to the chest wall. Many times it is necessary to literally peel the adhesion from the chest wall on account of the proximity of lung tissue in the adhesion band. In these cases, due to the pain of cauterizing the parietal pleura and the difficulty of seeing all parts of the adhesion band, it is necessary to proceed very slowly with the use of the lamp and cautery in order to prevent postoperative pain and serous exudate. The upper one third of the pleural cavity is the usual site for this variety of adhesion and can be reached if the cautery is introduced into the third interspace at the anterior axillary line.

Thirdly, there is the broad, fan-shaped adhesion, usually quite fibrous, varying in thickness, but exceedingly broad, attaching itself to a large area of the chest wall. These adhesions are ofttimes organized and have many blood vessels. The apex of the lung is the favorite location and so firmly is the lung involved in this tissue, that it is impossible to cauterize it without considerable danger to nearby lung structure. This class of adhesions frequently resembles a fold of lung structure with bands of connective tissue uniting it to the pleural surface of the chest wall. It is with great difficulty and much patience that these bands are cut or more often peeled from the wall of the thorax. Small blood vessels frequently encountered in this variety are cauterized without much danger of hemorrhage. The x-ray is of very little assistance in determining the presence of band adhesions, and they are not diagnosed until after the introduction of the thoracoscope. It is the most tedious and trying of all band operations to both patient and surgeon and necessitates a very decided degree of coöperation on the part of all associated.

The reason for intrapleural pneumolysis is to produce further compression of the incompletely collapsed lung, to close open cavities in the lung, relieve symptoms and obtain, if possible, a sputum negative for tubercle bacilli.

By careful inspection of the adhesions to be cauterized the danger of hemorrhage from the severed bands can be prevented and if it does occur, it can be readily controlled by direct application of the cautery to the bleeding point. I have encountered only one case in which bleeding from a chest wall stump occasioned some alarm; deep cauterization was successful in sealing the open vessel.

Not all the bands seen through the thoracoscope can be severed, for many times anterior and posterior adhesions are located so near the mediastinum and its great vessels that cauterization is contraindicated by the danger of heat to these structures. Lung tissue in the bands must be given a wide berth.

Following the release of the bands that are holding a cavity open, it is not unusual to notice a ballooning of this cavity within the pleural space at each respiration taken by the patient and this at first appears quite alarming if the patient talks or coughs. Removal of the cautery at once, silence for the patient and a further control of the cough by narcotics are indicated.

The local trauma occasioned by the puncturing of the chest wall by the trocar and cannula used for the insertion of the thoracoscope and the cautery is relatively unimportant, but the bleeding from the small vessels injured by thoracentesis is sometimes quite annoying and often obscures the field of vision, necessitating the frequent removal and cleaning of the thoracoscope lens.

The extensive skin emphysema, involving the chest, arms and neck which many times follows intrapleural pneumolysis causes considerable discomfort to the patient, and the pain from the air in the subcutaneous tissue may last from a few days to a week. It is quite rapidly absorbed and is not considered an alarming symptom but the question of air embolism as a complication should receive some thought.

Caseous nodes vary in size from very minute points seen on the pleural surfaces to areas an inch or more in diameter and are usually located on the visceral pleura in the vicinity of the adhesive band. Great care should be exercised in avoiding these areas, as empyema is liable to be the sequela if caseous nodes are ruptured. Thick fibrous exudate, white and shiny in appearance is frequently seen, involving the interlobar septum and contiguous portions of the

lobes. This seemed to be present in cases where marked tension is caused by high intrapleural pressure. This condition has also been noticed surrounding the portions of the adhesive bands attached to the lung tissue and is likewise due to extreme tension.

Emphysematous blebs are encountered on the parietal pleura and their proximity to the desired area of cauterization may complicate the severance of the bands. In two cases where these emphysematous blebs occurred, cauterization of the bands was completed without damage to these blebs.

Pleural effusion will sometimes cover the adhesive bands with a profuse exudate that will impede the rapidity of cauterization by obscuring the true nature of the bands.

Fever occurring a week or ten days after pneumolysis is apparently caused by the presence of postoperative exudate or by too large a refill of air after operation, producing some obstruction to drainage as a sequela to complete compression. It is better cautiously to give small refills of air not in excess of 200 cc. at frequent intervals of five to seven days than to attempt a forcible collapse of the lung by compression.

Dyspnea with increased heart action following pneumolysis may be occasioned by high positive intrapleural pressure and can be readily relieved by aspiration of the excess air if a spontaneous rupture of the lung has not occurred. Serous exudate may be the cause.

In re-operating on one case, 30 days following the initial pneumolysis, the wound of this operation on the visceral pleura covering the stump of the severed band was still open and a serous exudate could be plainly seen covering the surface. The wound in the parietal pleura, on the chest wall, was partly granulated. In another case about 60 days after initial pneumolysis only scar tissue appeared at the site of the previous operation. This would indicate that a period of at least six weeks must elapse before the pneumolysis wound of lung or chest wall may be considered healed.

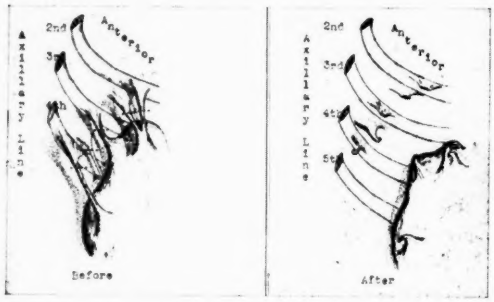
The time of operation has varied from 15 minutes to one hour and a half. I would rather limit my time to 60 minutes and go into the chest a second time to complete the cauterization than to continue the heat from the thoracoscope and the cautery which might produce damage to the delicate structures within the chest cavity.

The recorded cases, history, x-rays, charts and drawings are from patients confined at the Belmont Hospital at Worcester, Massachusetts during the past year and represent a series of 20 cases in which artificial pneumothorax and intrapleural pneumolysis were performed.

I am giving the facts of the cases as they appear today although I realize that too little time has elapsed to determine their ultimate results. This I hope to produce in the future on a more extended number of cases.

The first pictures shown below will give an idea of the various kinds of bands seen at operation and these will be followed by a few cases in which the x-ray prior to operation will define the bands to be cauterized. Then you will see the findings at the time of operation and the after results in closing the lung cavities.

CASE No. 1. A. M. 22 years of age. Admitted to Belmont Hospital, Worcester, Mass., seven months ago. During the past year he had complained of cough and had occasional hemoptyses. Artificial pneumothorax was started five months ago and intrapleural pneumolysis



CASE A. M. Pneumolysis. July 8, 1932. Left Lung. Five adhesions attached to the 2nd, 3rd, and 4th ribs, holding lung to the chest wall, anteriorly. Area cauterized: ---------. Adhesions were thin, fibrous bands, cut very easily, and lung retracted about two inches. Time: 30 minutes.

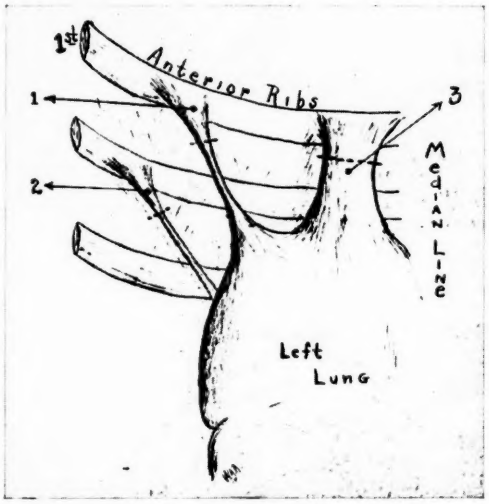
was performed two months ago. The pneumolysis drawings show five small thin bands holding the lung to chest wall. Upon the introduction of the thoracoscope into the chest cavity, only one band was seen in the extreme apex and as this band was cut and as the lung collapsed, one by one, the other bands came into view. Complete collapse of the lung was attained.

CASE No. 2. E. G. 24 years of age. Admitted to Belmont Hospital, Worcester, Mass., nine months ago with the history of being ill one month. Complained of fever, fatigue, nervousness and hemoptysis of four to eight ounces. Rapid collapse therapy was given to control the hemoptysis. Intrapleural pneumolysis was

CASE E. G. Pneumolysis. 1—Broad, round adhesion to chest wall, over ½" wide, with lung tissue to within ¾" of chest wall. Cauterized ½" from chest wall. ---------: Area cauterized.

performed five months ago by cauterization of a broad round adhesion which was holding the lung from complete collapse. Discharged from Belmont Hospital eight months after admission. Right lung is in complete collapse.

CASE No. 3. B. C. 29 years of age. Admitted to Belmont Hospital, Worcester, Mass., 12 months ago with hemoptysis of over sixty ounces. Disease was supposedly arrested for past 14 months before this large hemorrhage occurred.

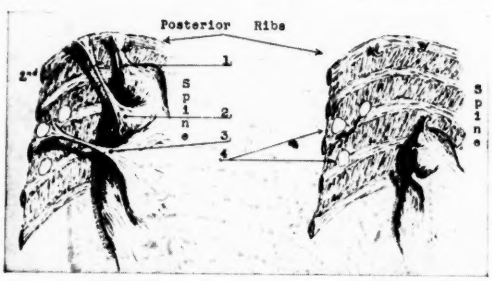


CASE B. C. Pneumolysis. Belmont Hospital.

1—White string band, 1" in length and ⅜" in diameter. Cut easily and allowed lung to collapse.
2—White string band, somewhat broader than band No. 1. Marked collapse after cauterizing.
3—Broad ¾" band. Lung tissue to within ¾" of chest wall. Appeared to contain blood vessels. Cauterized ½ way through.
---------: Area cauterized.

Artificial pneumothorax was instituted soon after admission to close a large cavity in the left lung. Intrapleural pneumolysis was performed about four months ago. Drawing shows three adhesions, one thin, one heavy and one broad band, that are holding open the cavity in the lung. Complete collapse was the result of operation. Patient was discharged home two months ago markedly improved.

CASE No. 4. E. T. 24 years of age. Admitted to Belmont Hospital, Worcester, Mass., six months ago in a toxic condition with multilocular cavitation in upper half of right lung.



Before. After.

CASE E. T. Pneumolysis, June 13, 1932.

1—Band 1" long.
2—Long string band, easily cut.
3—Heavy 3" band, over ½" in diameter, containing blood vessels in part attached to lung.
Cautery at 4th posterior axillary line.

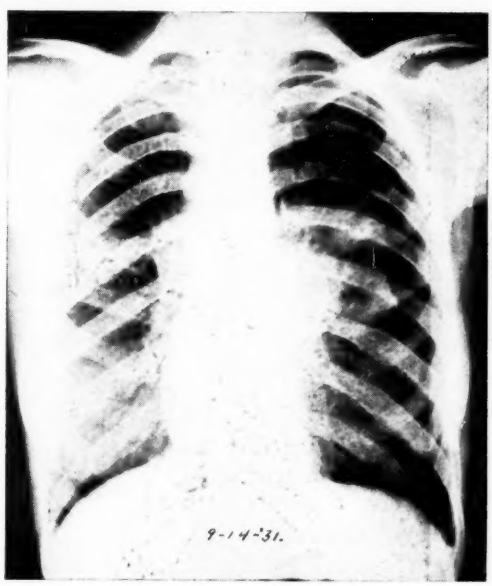
1—Short, round heavy band, cut with difficulty. Lung contracted after this was cauterized.
4 — Emphysematous blebs on chest wall.
Time of operation, 20 min.
---------: Area cauterized.

Artificial pneumothorax commenced one month after admission and intrapleural pneumolysis was performed two months later. The result of operation has established complete collapse of the right lung. The drawing shows a combination of two varieties of bands and the presence of three emphysematous blebs on the chest wall.

CASE No. 5. G. G. 42 years of age. Admitted to Belmont Hospital, Worcester, Mass., 18 months ago with tuberculous involvement of left lung and diabetes. Artificial pneumothorax was instituted soon after admission but a broad adhesion prevented collapse. Drawings in this case will show a band about four inches in width that necessitated two operations to eliminate, and resulted in a perfect collapse.

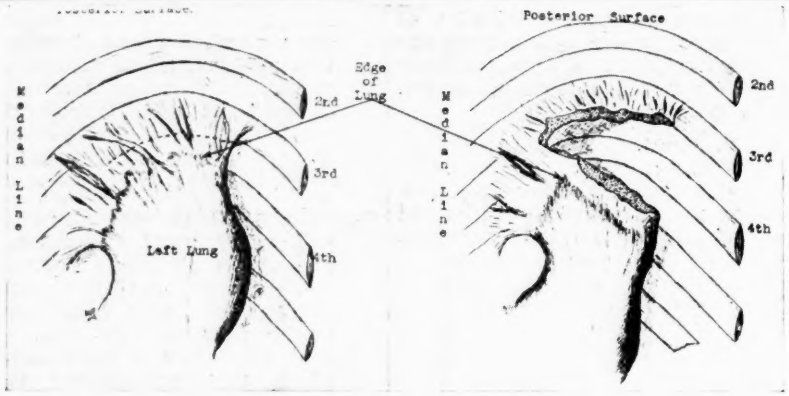
CASE No. 6. Mc. D. 36 years of age. Admitted to Belmont Hospital, Worcester, Mass., one year ago, with a history of having had pulmonary tuberculosis for the past 14 years. X-ray study showed marked involvement of upper half of the right lung with cavitation. Artificial pneumothorax was given 10 days after admission, but a large band prevented complete collapse and intrapleural pneumolysis became necessary. Drawing shows a large band that was peeled from the chest wall and resulted in a perfect collapse of the lung. This shows a case of at least 14 years' duration in which activation developed and was controlled in ten months by artificial pneumothorax and intrapleural pneumolysis.

CASE No. 7. E. D. 20 years of age. Admitted to Belmont Hospital, Worcester, Mass., 15 months ago in a toxic condition with a history of having been ill for four months. The adhesive band and the cavity are clearly defined in x-ray plates A and B. Intrapleural pneumolysis was performed about five months ago, resulting in complete collapse as is shown in plate C. This patient was discharged from the hospital 12 months after admission free of all pulmonary symptoms, with a gain in weight of 32½



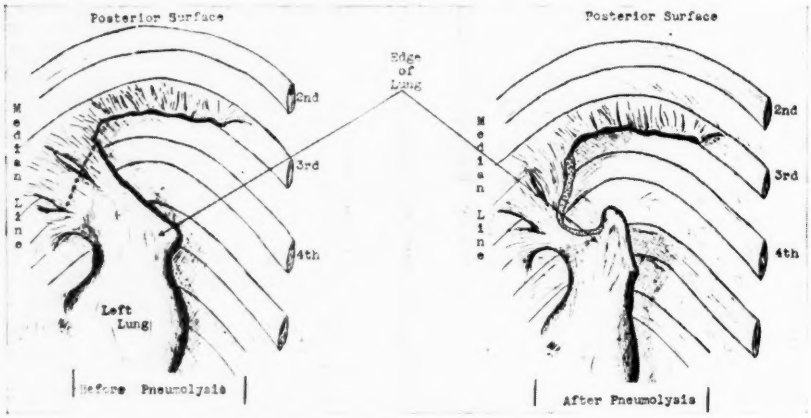
Belmont Hospital, 9-14-1931.

E. D. X-ray, Plate A. Shows considerable collapse of left lung, three days after rapid artificial pneumothorax was instituted.



Geo. G. Pneumolysis, June 8, 1932. Complicated by diabetes. Thoracoscope introduced at 6th interspace, posteriorly, showing broad, fan-shaped, fairly dense band, four inches in width, attached to the 3rd and 4th ribs. Lung tissue to within ½ inch of chest wall. Cauterized about half of band. Operation, 30 minutes. ---------: Area cauterized.

Following pneumolysis. Half of adhesion band severed. Note retraction of lung. Lung still held to anterior surface of chest wall by part of band remaining.

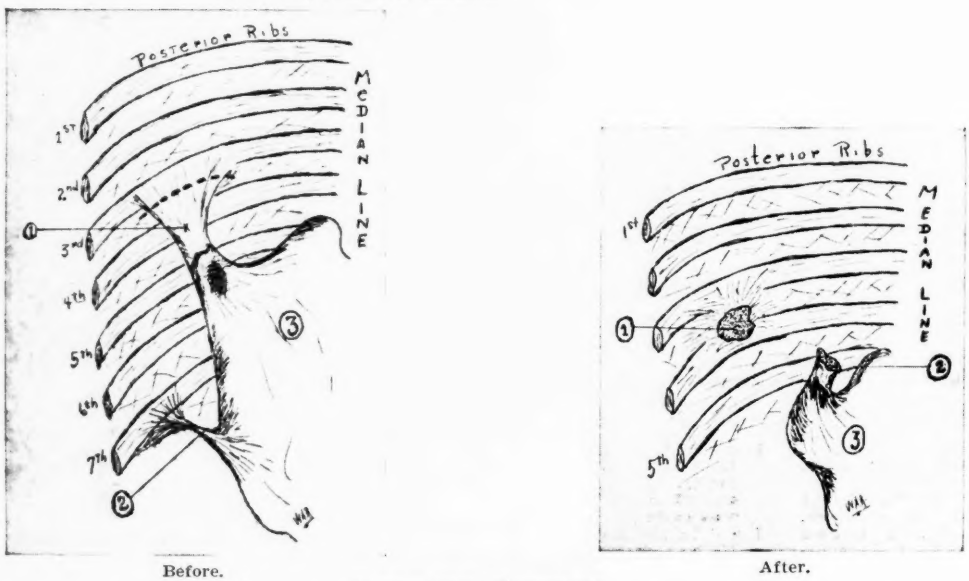


CASE GEO. G. 2nd Pneumolysis, July 6, 1932.

Wound on visceral pleura found open and covered with a serous exudate. Wound on parietal pleura on chest wall, granulating. About 1½" of remaining band cauterized, allowing lung to further collapse.

---------: Area cauterized.

Time of operation: 50 minutes.



Before. After.

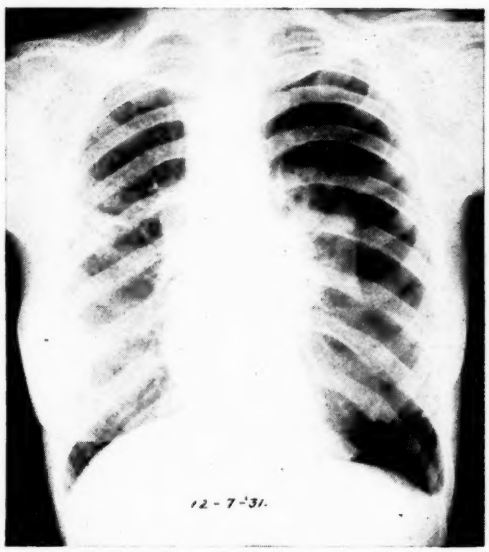
CASE J. McD. Pneumolysis.

1—Band, 1" diameter, firm, round, holding entire lung out, containing blood vessel. Cauterized, some bleeding. Marked collapse followed.
2—Small string band, easily cauterized.
3—Tissue of right lung, entering adhesion to within ½" of chest wall.
---------: Area cauterized.

1—Attachment to chest wall. Area cauterized.
2—Band cauterized and retracted.
3—Right lung, collapsed.
Time: 60 minutes.

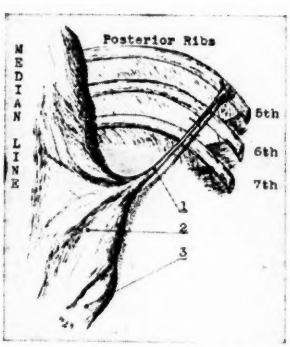
pounds and with a negative sputum. Closing of the cavity in the left lung could not have been attained except by intrapleural pneumolysis.

In all of the cases presented in this article, except one (No. 2, E. G.), the sputum examination was positive for tubercle bacilli before operation. All became negative after complete compression was established. The weight gain in this series has varied from ten to forty pounds and all symptoms of pulmonary tuberculosis are absent.

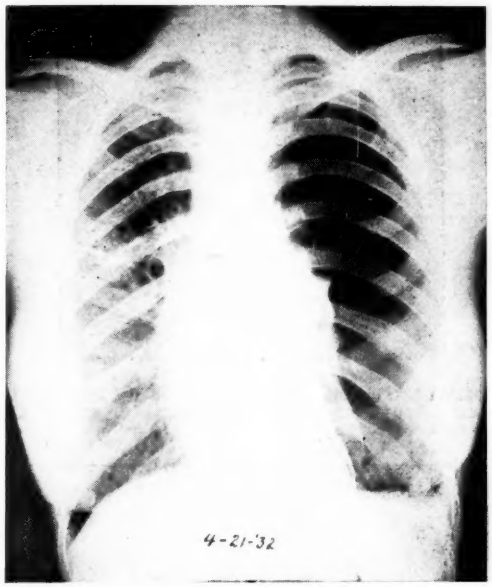


Belmont Hospital, 12-7-1931.

E. D. X-ray, Plate B. Both lungs show continued improvement with a small amount of fluid at the left base. Adhesion band from lung to chest wall is well defined.



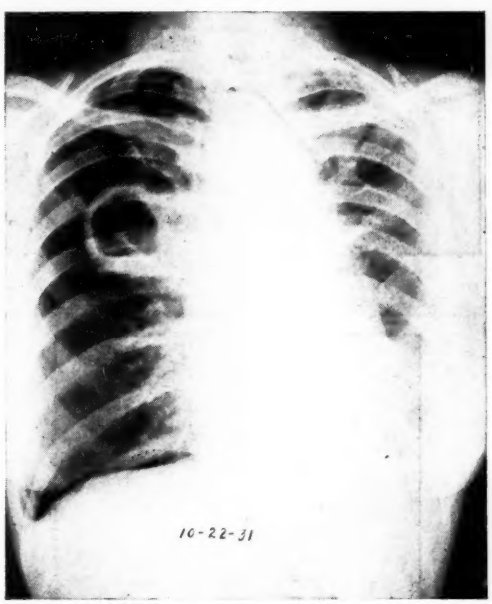
CASE E. D. Pneumolysis. April 20, 1932.
1—Band, 3/8" thick, 4" long, round and tough.
2—Upper lobe.
3—Lower lobe.
---------: Area cauterized.
Thoracoscope at 6th space posteriorly.
Cautery at 4th space, anterior axillary line.
Time: 16 minutes.



Belmont Hospital, 4-21-32.

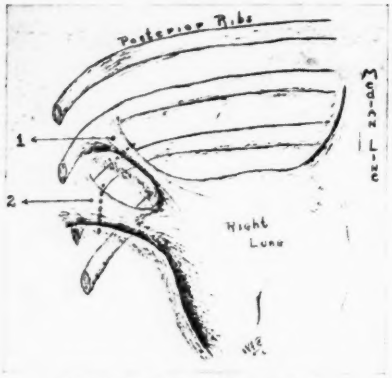
E. D. X-ray, Plate C. Shows the left lung in complete collapse after pneumolysis. Small amount of fluid at left base.

CASE No. 8. M. R. G. 29 years of age. Admitted to Belmont Hospital 16 months ago with a history of being ill with pulmonary tuberculosis for the past three years. Compression of the right lung was started three months after admission to Belmont Hospital. X-ray plate A shows a large cavity held open by a heavy band to the right chest wall. The pneumolysis plate shows exactly what was found at operation. In addition to the adhesions there was a marked edematous area with a thin white exudate found on the broad band and at the insertion of both bands to the right lung. Plate B taken two days after operation shows further collapse of the right lung with stump of one band clearly seen on the chest wall. Her improvement has been remarkable.



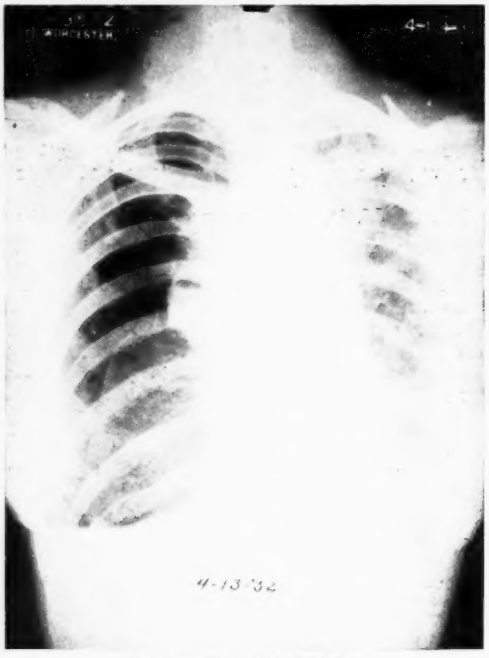
Belmont Hospital, 10-22-31.

M. R. G. Plate A. Shows large cavity in right lung held open by a strong adhesion. No fluid. Left lung holding up well.



CASE M. R. G. Pneumolysis.

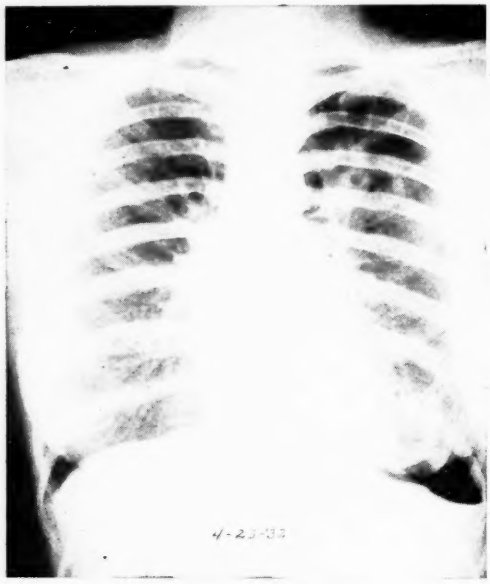
1—Adhesion ¾", circular, heavy, cauterized ½" from chest wall.
2—Broad, fibrous band, thin as paper, but 1" in width. Cauterized part way through.
---------: Area cauterized.



Belmont Hospital, 4-13-32.

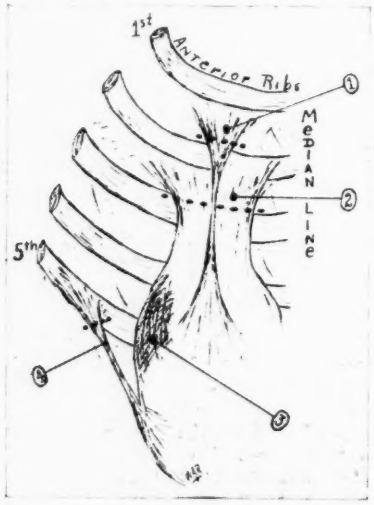
M. R. G. Plate B. Shows more collapse of right lung following pneumolysis. Note stump of adhesion on chest wall.

CASE No. 9. M. G. 25 years of age. Admitted to Belmont Hospital about 15 months ago. She had been an arrested case of pulmonary tuberculosis for the past five years but had become re-activated in February, 1931, following a tonsillectomy with ether anesthesia. Her condition was considered toxic with considerable involvement of the larynx and the usual pulmonary symptoms. X-ray Plate A shows the cavity held open by three adhesive bands to the chest wall. Intrapleural pneumolysis was performed four months ago in order to close this cavity. Pneumolysis plate shows the findings at operation and plate B the further compression of the lung with no evidence of the former cavity or of the adhesive bands. Patient was relieved of all previous symptoms, with a weight gain of 21 pounds. This

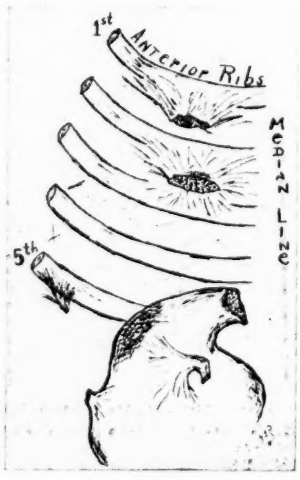


Belmont Hospital, 4-23-32.

M. G. Plate A. Shows left lung reëxpanded definitely outlining a cavity at the 6th rib, posteriorly with the upper part of the lung held to the chest wall by three string-like adhesions. No change is noted in the condition of the right lung. There is present a small amount of fluid in the left pleural cavity.



Before.

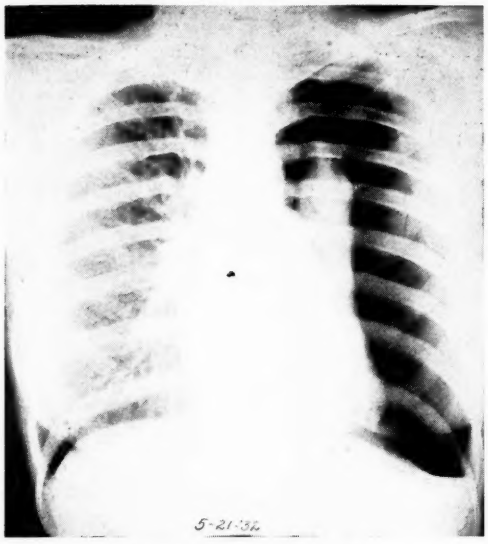


After.

CASE M. G. Pneumolysis. May, 1932.

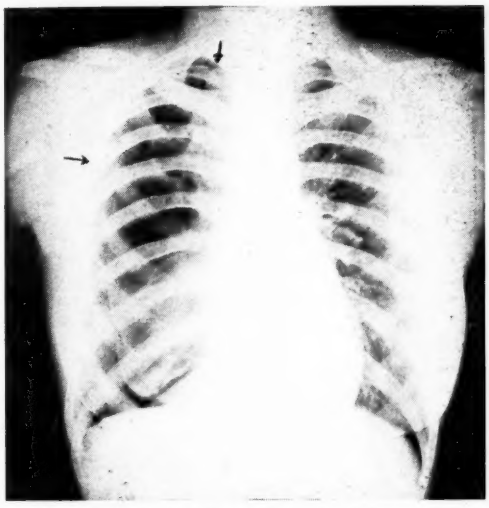
1—Round, string band—1½" long, ⅜" diameter.
2—Broad band 1" wide, very thin.
3—Area of edematous lung, silvery in appearance.

After Bands 1 and 2 were cauterized lung became completely collapsed.
Cautery at 4th interspace, anterior axillary line.
Thoracoscope at 6th interspace posteriorly.

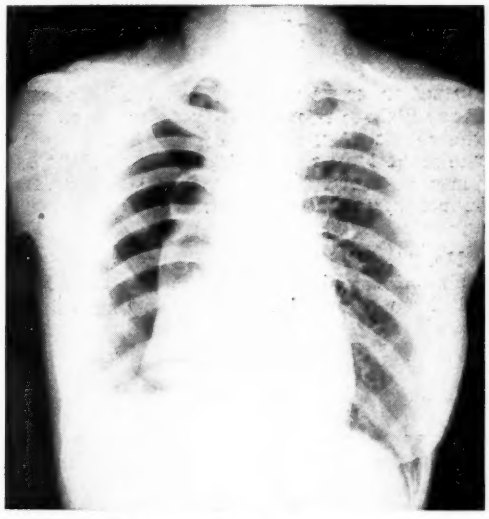


Belmont Hospital, 5-21-32.

M. G. Plate B. Shows almost complete collapse of the left lung. Cavity closed. No evidence of adhesions.



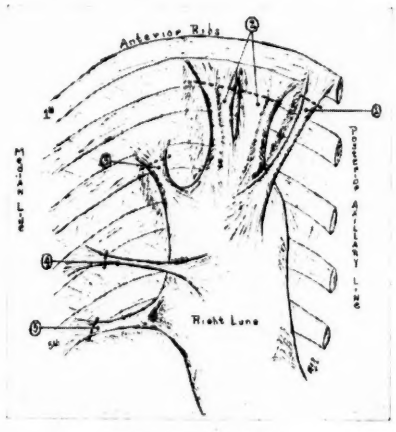
B. T. X-ray, Plate A. Shows partial collapse of right lung. Adhesion seen to 5th rib, laterally. Note cavity.



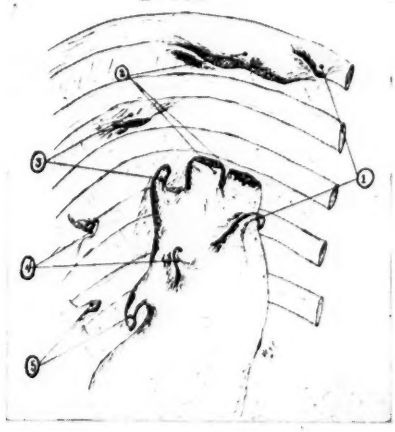
B. T. X-ray, Plate B. After pneumolysis shows progressive collapse of lung. Note cavity outline.

case illustrates the oft-repeated statement that pulmonary tuberculosis in all its various types is a chronic disease which may assume activation at any time. This is a case of old fibroid calcified involvement of both lungs which within four months, became actively progressive as the result of ether anesthesia, and in an additional three months under the best sanatorium care developed cavitation that demanded immediate collapse therapy. Properly classified as a bilateral involvement and a unilateral activity with cavitation at the subclavicular area, artificial pneumothorax, cautiously used and with intrapleural pneumolysis, has been successful in producing a perfect complete collapse.

CASE No. 10. B. T. 20 years of age. Admitted to Belmont Hospital 10 months ago with a history of one month's illness. Due to hemoptysis, the rapid collapse therapy of artificial pneumothorax was instituted one month after admission. X-ray plate A shows a clear outline of the cavity with adhesions to the fifth rib laterally and to apex. Intrapleural pneumolysis was performed four



Before Pneumolysis.

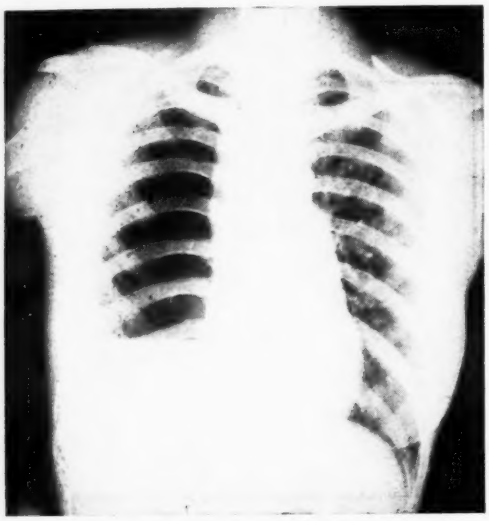


After Pneumolysis.

CASE B. T. May 26, 1932.

1—Round ⅜" adhesion with two blood vessels. Cauterized easily.
2—Broad band, 1½" wide with round adhesion on both edges, open area in middle of band. No lung tissue or blood vessels.
3—Short, heavy, round adhesion, cauterized with difficulty.
4—Long string adhesion.
5—Strong round adhesion, cauterized with difficulty.
---------: Area cauterized.

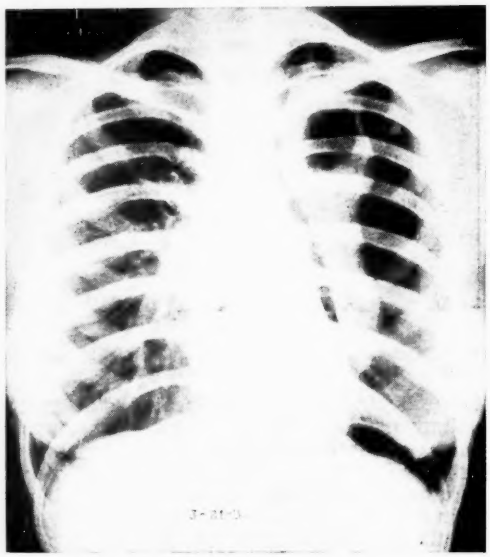
Pedicles on right lung waved like fingers after collapse of lung.
Stumps on chest wall were well defined.
Thoracoscope at 6th interspace posteriorly, Cautery at 4th interspace in posterior axillary line.
Time: 55 minutes.



B. T. X-ray, Plate C. Showing complete collapse of right lung.

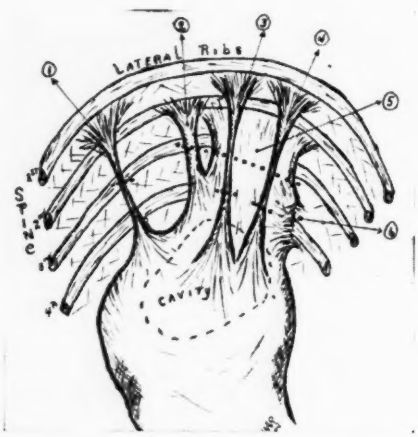
months ago to close this cavity. Pneumolysis plate. Instead of one band being present as shown on the last x-ray, five bands needed cauterization to release the tension on the cavity. X-ray plate B taken 10 days after operation shows the result of pneumolysis with more collapse of the right lung and cavity clearly outlined. X-ray plate C shows result of complete collapse, one month after pneumolysis.

CASE No. 11. E. C. 20 years of age. Admitted to Belmont Hospital 12 months ago with a history of three months' illness following ether anesthesia. The patient was toxic with the usual symptoms of pulmonary tuberculosis. X-ray (Plate A) after compression of the left lung which was suspended by numerous bands to the chest wall. Within this lung there was a cavity. Pneumolysis performed five months ago produced a partial collapse. See pneumolysis plate No. 1. At this time five bands were severed with some difficulty. There was marked improvement in the

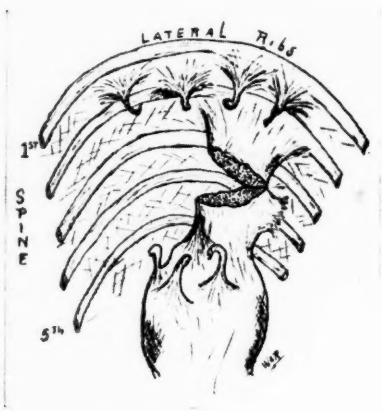


Belmont Hospital, 3-21-32.

E. C. X-ray, Plate A. Shows marked compression of left lung with adhesion to apex holding cavity open. Mediastinum has stiffened considerably. There is no fluid present in left pleural cavity. Right lung appears clear.



Before Pneumolysis.



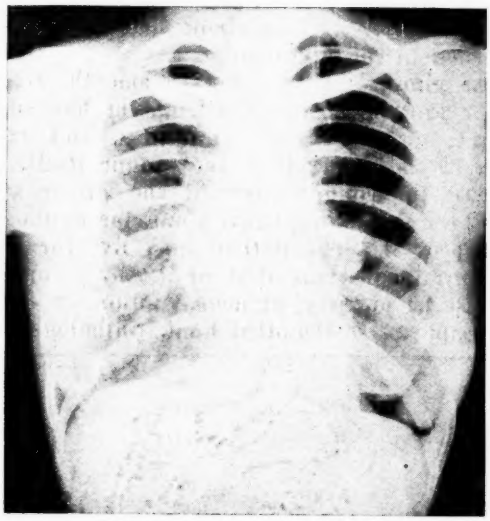
After Pneumolysis.

CASE E. C.

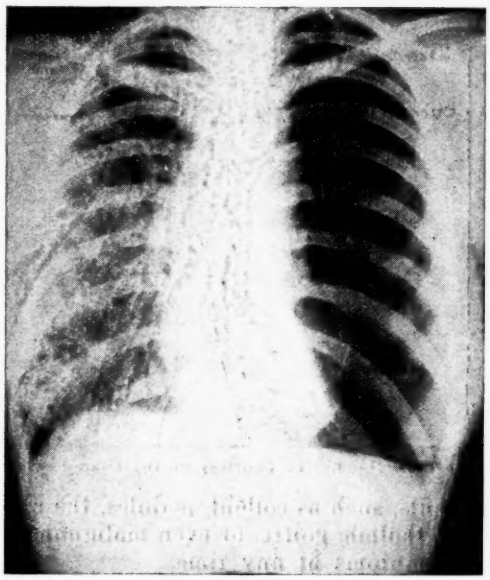
1—String band 1½" long. Cauterized.
3—String band 1½" long, holding cavity out. Cauterized.
4—String band 1½" long, holding cavity out. Cauterized.
2—Short, heavy round band. Cauterized.
5—Broad, heavy, fan-shaped band, 1" wide, holding apex of lung firmly to chest wall, extending down side of lung. Only top of band was cauterized. Lung tissue did not extend very far in band No. 5.
6—Area adherent to chest wall. Not cauterized.
---------: Area cauterized.

When bands 1, 3, 4 were cut, tension upon apex of lung was relieved.
By cutting bands 2 and 5, considerable more tension was relieved. Lung was in further collapse by from 1 to 1½".

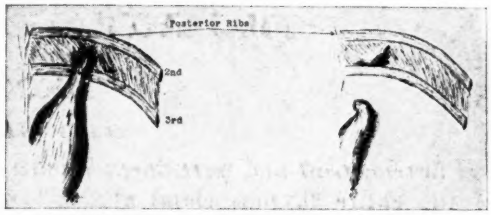
general condition of the patient. Sputum was still positive. Plate B shows the lung in partial collapse with the cavity held open by the remaining adhesion to the chest wall at the third rib. Pneumolysis again performed about 60 days after the first cauterization. See pneumolysis plate No. 2 which shows the remaining



E. C. X-ray, Plate B. Before 2nd pneumolysis. Cavity still open but smaller.



E. C. X-ray, Plate C. Following pneumolysis, shows complete collapse of cavity.



CASE E. C. 2nd Pneumolysis, 7-13-32.

One broad band, ¾″ in diameter, attached to the 2nd interspace posteriorly, holding cavity open. Severance of band produced complete collapse of lung.

---------: Area cauterized.

Time of operation: 35 minutes.

band holding the lung to the chest wall. The result of severing this band produced complete collapse of the lung, a negative sputum, a remarkable improvement in the general condition of the patient and a gain of 20 pounds in weight. Plate C shows the result of the second operation.

During the past year, 20 patients having been subjected to pneumothorax were considered suitable for intrapleural pneumolysis and of these all but three were successful in having a complete collapse. The average time of operation was 40 minutes. Fifty-three bands were seen and 51 cauterized. There were 30 small bands, 14 of the heavy and 9 of the broad fan-shaped type. There were two pleural effusions, one tuberculous, which cleared after a few aspirations. There was some evidence of tuberculous involvement of the pleura in 13 cases, as noted by the presence of caseous nodes, emphysematous blebs and caseous exudate on the lung structure. Skin emphysema occurred in three cases.

In conclusion let me emphatically state that surgical collapse therapy in pulmonary tuberculosis is now an established procedure of unquestionable value and in suitable cases I believe it is the most effective treatment in producing rest for a diseased lung.

SUMMARY

Artificial pneumothorax and intrapleural pneumolysis must not be considered a panacea for all cases of pulmonary tuberculosis, but in certain selected cases the intelligent use of intrapleural pneumolysis as an adjunct to artificial pneumothorax in facilitating the closure of tuberculous cavities, will serve as a most valuable mode of treatment.

MORTALITY RATES

Telegraphic returns from 85 cities with a total population of thirty-seven million for the week ending February 11, indicate a mortality rate of 11.8 as against a rate of 11.9 for the corresponding week of last year. The highest rate (19.1) appears for Washington, D. C., and the lowest (5.0) for Peoria, Ill. The highest infant mortality rate (16.1) appears for Bridgeport, Conn., and the lowest for Knoxville, Tenn., Long Beach, Calif., Lowell, Mass., Miami, Fla., Peoria, Ill., Schenectady, N. Y., Waterbury, Conn., and Wilmington, Del., which reported no infant mortality.

The annual rate for 85 cities is 12.7 for the six weeks of 1933, as against a rate of 12.0 for the corresponding period of the previous year.

The Bureau of the Census announces that in the United States death registration area, in the calendar year 1931, there were 1,322,587 deaths, or a death rate of 1107.5 per 100,000 population, as compared with 1,343,356 deaths, or a rate of 1133.1 in 1930.

The five leading causes of death in 1931 were the same as in 1930, namely: diseases of the heart, cancer, nephritis, cerebral hemorrhage, and the pneumonias, and in each of the years these five causes were responsible for slightly over 50 per cent of the total number of deaths which were reported in the registration area.

NEW ENGLAND SURGICAL SOCIETY

LINGUAL GOITRE*

BY RICHARD H. MILLER, M.D.†

THE development and permanent localization of the entire thyroid gland at the base of the tongue are extremely unusual, and any such instance is worthy of record. The term "lingual thyroid" may be used for those cases in which a normal gland exists in this region, but if there are pathological changes which lead the gland to enlarge and cause symptoms, one should speak of it as "lingual goitre".

In early embryonic life the pharynx gives off, in the median ventral line, a stalk of cells which grows downward through the hind part of the tongue to the neck, eventually branching out in front of the trachea and forming the thyroid gland. The stalk or duct becomes obliterated, but a blind pit remains at the back of the tongue, called the foramen cecum. The normal thyroid develops as a detached group of entodermal cells, although there is a theory that sometimes it arises in part from the postbranchial bodies, or fifth pouches[1]; in such a manner could be explained certain forms of lateral ectopia. A lingual thyroid represents the result of adult development without descent. To quote Hartley, "A lingual thyroid in many cases is a true ectopia thyroidis and then represents the whole of the acting thyroid tissue in the body."[2] In some instances partial descent, with aberrant development, occurs. The parathyroid glands, however, develop from the third and fourth pharyngeal pouches on each side; therefore in

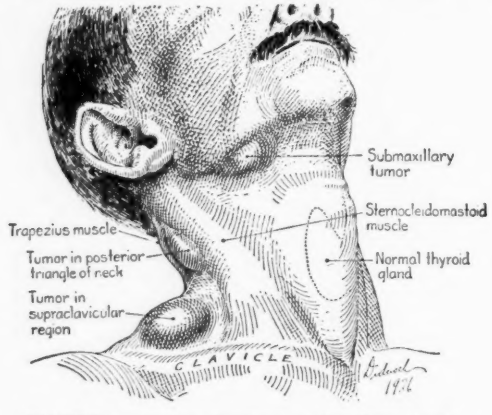


FIGURE I. By the Courtesy of Dr. Dean Lewis.

a case of lingual thyroid the parathyroids are still in their normal situation lower down in the neck.

Lingual thyroid was found by Cattell only twice in 7,600 thyroid operations at the Lahey Clinic[3, 4] and Ulrich[5] found only two cases in 4,000 patients with thyroid disease, at the University of Pennsylvania Hospital. According to Ulrich[5] there have been about one hundred cases recorded in the literature.

The gland is observed as a smooth, reddish tumor protruding upward from the base of the tongue, quite without tenderness, and rather firm. It is redder than the tongue itself. On pulling the tongue forward the tumor seems to fill the whole oropharynx and the uvula rests on top of it. The patient may live for years, entirely unconscious of it, or it may become noticeable at puberty, at menstruation, or during pregnancy. On the other hand, pathological de-

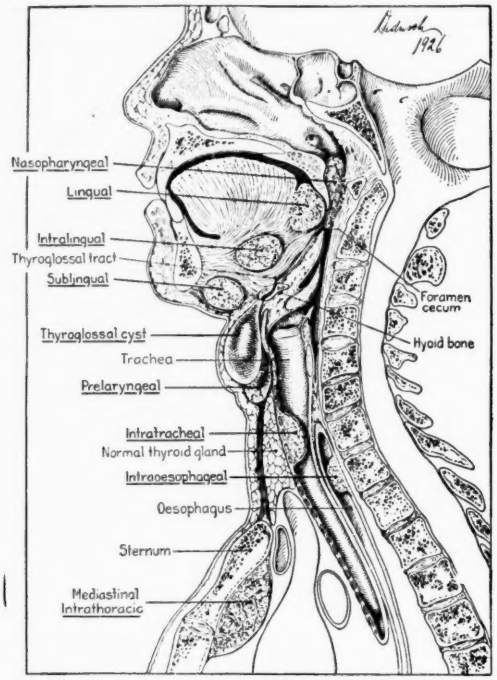


FIGURE II. By the Courtesy of Dr. Dean Lewis.

velopments, such as colloid, nodules, the changes of exophthalmic goitre, or even malignancy may cause symptoms at any time.

The diagnosis should be easy, because no other condition gives rise to just this picture of a smooth, red, symmetrical, painless tumor. Cancer is hard, ulcerated, and almost always on one side. Benign tumors are about as rare as lingual thyroid, if not more so.

The treatment is characterized by opportunism. If the gland results in obstruction to swallowing or breathing, it should be immediately removed. If it causes no symptoms, and is accidentally discovered, excision is not necessarily indicated, and scientific expectancy is in order. At operation it would be ideal if some of the gland could be left in situ, but this is not always easy. In the case here reported it was thought that a portion of the gland had

*Read at the Annual Meeting of the New England Surgical Society at Hartford, Conn., September 30, 1932.

†Miller—Associate Surgeon, Massachusetts General Hospital. For record and address of author see "This Week's Issue," page 504.

been left, but such proved not to be the case. If all the patient's thyroid tissue is extirpated, myxedema will of course result, but this can be adequately controlled by the administration of thyroid extract, which need not be started for five or six weeks or more after operation. Exploration of the neck has been advocated, in order to determine if there be other thyroid tissue at the normal site of the gland[5]; this is unnecessary, because if operation becomes imperative it must be done anyway, and the physician must be prepared to combat myxedema, the occurrence of which will soon become apparent through the estimation of the basal metabolic rate, and development of the characteristic clinical picture.

The operation is not difficult, the most bothersome steps being those necessary to procure proper visualization, through traction, of the operative field. Anesthesia is given by means of tubes inserted through the nose and down into the bottom of the oropharynx, or by intratracheal insufflation. The jaws are held open by a gag, tension sutures are placed through the tip of the tongue, and through its base on either side of the tumor. The oropharynx is packed with gauze. An incision is made on each side, anteriorly, at the base of the tumor, and then blunt dissection suffices to shell out the gland. The bleeding is not profuse, as stated by Crotti[6] and deep sutures of catgut are placed from side to side closing the wound rapidly, and effectively controlling the bleeding. After operation, frequent use of a mouth-wash is advisable. The patient should be carefully watched, by a special nurse, for two or three days. A tracheotomy tube should be kept beside the bed, although it will probably be unnecessary. Following the removal of the gland, frequent determinations of the basal metabolic rate are essential, as well as watching for signs of myxedema.

REPORT OF CASE

A 32 year old married American housewife entered the hospital on May 10, 1932.

Chief complaint: Difficulty in swallowing.

Present illness: Four months ago, for the first time, this patient noticed some difficulty in swallowing, and a tendency for the food to regurgitate into her nasopharynx. She went to a mirror and on looking into her mouth saw a red swelling at the base of her tongue, about the size of a "golf ball". There later developed some difficulty in phonation, which steadily increased until her friends had trouble in understanding her speech. For the past three months she also noted a tickling sensation in her throat, relieved only by the ingestion of food. Consequently she states that she has eaten almost continually and it is to this that she attributes a gain of 20 pounds which has occurred since the onset of the present illness. For the past few weeks she has noticed in addition some difficulty in breathing when excited, and especially when exerting herself physically. She is not sensitive to heat or cold and has not noted tremors nor undue nervousness.

F. H. Mother died of "heart disease" at 50. No history of tuberculosis, cancer, nephritis or nervous disorders. No one in the family has had trouble similar to her own, so far as she knows.

Marital: Married 12 years. Has four children, the youngest two years. One child died, two are living and well, while the youngest has a "growth" on its head, of unknown nature. No miscarriages.

P. H. Had measles, mumps, whooping cough and chicken pox, as a child. No scarlet fever, diphtheria, typhoid fever, pneumonia, or other serious illness. No operations.

C. R. Slight dysphagia as described above. No nausea, vomiting, hematemesis, or abnormality of stools. Appetite and digestion excellent. Bowels move daily without catharsis.

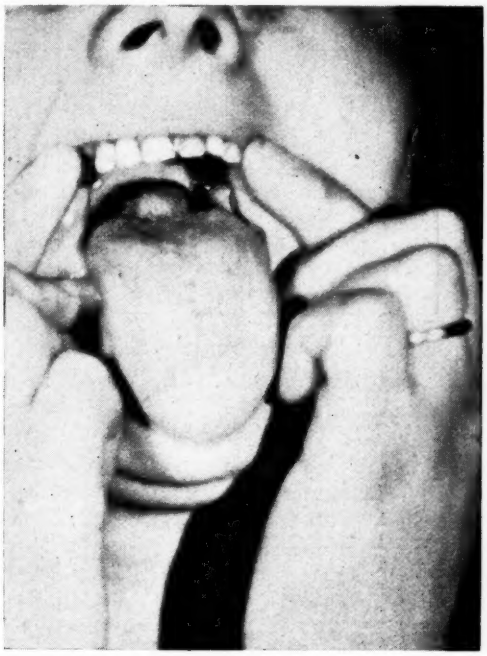


FIGURE III. Photograph of Patient.

G. U. No abnormal symptoms.

Cta. Normal.

N. M. No nervousness, tremor or paresthesias.

Weight. 165 pounds. Has gained 20 pounds in past four months.

PHYSICAL EXAMINATION

A well-developed and nourished, somewhat obese woman of 32 lying quietly in bed in no distress.

Eyes: Sclerae clear. Pupils equal and react to light and distance. No exophthalmos.

Ears: Normal externally.

Head: No exostoses. Hair normal.

Nose: No obstruction.

Mouth: Teeth fair with considerable dentistry. Projecting upward from the base of the tongue is a reddish, firm, smooth tumor, about four cm. in diameter. This is non-tender. It extends up against the soft palate and obstructs to a great degree the entrance into the oropharynx.

Glands: No abnormal lymphadenopathy.

Neck: The region of the thyroid is well padded with adipose tissue. It is impossible to map out any definite thyroid lobes or isthmus.

Heart: No enlargement, arhythmia or murmurs. Rate 75.

Lungs: Normal to percussion and auscultation.

Abdomen: Rather obese. No masses, spasm or tenderness.

Pelvic: Not relevant.

FIGURE IV. Photograph of tumor after excision.

Reflexes: K.J. normal. Babinski negative.

Extremities: Normal.

Laboratory: Hgb. 80%
Smear: 5/14/32
Polynuclear 59% Lymphocytes 28%; Large Monocytes 8%;
Eosinophiles 5%.
Urine: 1021—acid—0 sugar—0 albumen—sediment negative.

Basal Metabolic Rate —0.0

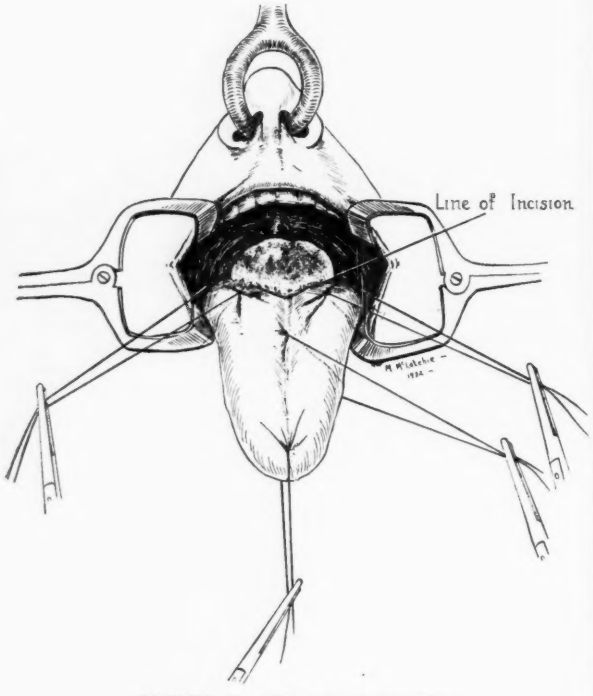


FIGURE V. Diagram of operation.

Operation: May 14, 1932.

Ether anesthesia through nasal tubes. The mouth gag was placed in position and the mouth widely opened. An attempt was made to pass the tube into the trachea but this was not successful, so it was left in the pharynx and gauze packed anterior to it. One loop of catgut was placed in the tip of the tongue, another just anterior to the tumor and one on either side of the tumor at about its middle. By gentle traction on all of these the gland was brought well into view and after making a short incision around the base of its anterior portion it was shelled out with great ease and with the minimum amount of bleeding. It looked as if some of the thyroid tissue were left in the tongue but one could not be sure. The wound was then closed rapidly with interrupted deep number 1 c.c.g. stitches. The nasal tube was left in place, the gauze removed and all except the anterior stay suture in the tip of the tongue, taken out. The patient's condition was excellent and she was breathing freely. We discussed at length the advisability of doing a tracheotomy but decided against it. The patient was sent back to bed in excellent condition.

PATHOLOGICAL REPORT

Gross: A distinct, slight encapsulated, ovoid and finely lobulated soft mass of thyroid tissue 4 x 3 x 3 cm. in size and weighing 19 Gm. It is covered on one surface by normal mucous membrane of the mouth.

Section reveals a very moist, glistening, coarsely trabeculated, mottled pinkish-grey surface with numerous 1-5 mm. glistening areas of colloid, some clear, other reddish and hemorrhagic in appearance.

FIGURE VI. Microphotograph of Lingual Goitre.

Diagnosis: Marked involution.

Comment: There is no evidence of malignancy.

From this time on her convalescence was uneventful. Three days after operation she stated that she was surprised that she could see better and hear better than she could before.

May 21, 1932. Basal metabolic rate minus 30. Wound healing rapidly.

May 23, 1932. Basal metabolic rate minus 40. Wound entirely healed.

The patient then went home, and reported to the hospital on July 20, 1932, at which time her B.M.R. was minus 28. She was not taking thyroid extract, and felt well, but somewhat sleepy.

August 9, 1932. Reëntrance into the hospital.

She was still not taking thyroid, and represented a case of complete cachexia thyroprivia. Her chief complaint was "drowsiness and lack of ambition". Her memory and "power of concentration" were somewhat decreased. Her skin was rough and dry and she had noted some falling of her hair. There had been some puffiness of her eyelids and the backs of her hands and feet. Menstruation occurred regularly but the duration was increased. Her appetite had decreased, but she had gained over 10 pounds. She frequently felt chilly.

August 12, 1932. Electrocardiogram; normal rhythm. Rate 90. Slightly inverted T_1. Inverted T_2 and T_3 (late inversion).

RECORD OF BASAL METABOLIC RATE

August	10,	1932	minus 32
"	11,	"	" 36
"	12,	"	" 35
"	13,	"	" 36
"	15,	"	" 30
"	16,	"	" 40
Daily administration of thyroid extract started this day.			
"	17,	"	" 35
"	18,	"	" 31
"	19,	"	" 27
"	20,	"	" 25
"	22,	"	" 24
"	23,	"	" 22
"	24,	"	" 16
"	25,	"	" 18
"	26,	"	" 19
"	27,	"	" 11
"	29,	"	" 8

The patient then went home, taking thyroid extract, and feeling perfectly well.

COMMENT

This case is one of a woman who lived to the age of 32 before discovering a lingual thyroid, which then began to cause symptoms of obstruction both to respiration and deglutition. Excision resulted in complete relief of the local symptoms, but initiated a condition of complete cachexia strumipriva. In view of the present day dependability of thyroid extracts, this procedure of complete excision is perfectly justifiable if an attempt at partial removal of the aberrant gland is very difficult. Exploration of the neck is not indicated.

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DISCUSSION

DR. HOWARD M. CLUTE, Boston, Mass.: Dr. Miller, in his paper, which he kindly permitted me to read, has covered very fully all the details of lingual goitre.

The thyroid in its development may have almost any variation from normal; in fact, myxedematous, non-viable, stillborn children have been recorded with no development of thyroid tissue save some low, irregular cells at the foramen cecum; and we know that the thyroid may descend, normally, but small areas of thyroid may remain to be found at the foramen cecum or along the tract.

I think the rarest anomaly in the developmental defects is that of lingual goitre, as Dr. Miller has said. Our personal experience has been limited to two cases, one, in which I recall very distinctly assisting Dr. Lahey some years ago, which exactly resembled the case Dr. Miller has reported, was operated on because of the same indications, obstructions of swallowing and breathing. Like his case, this woman developed myxedema after operation which has been persistent now over many years. Incidentally, within two or three years, while on thyroid extract, she has borne a healthy child.

The other case occurred as an incidental finding in a woman with leukemia and was of interest only as a curious finding at the autopsy. This woman was sixty years of age and didn't know she had a tumor in her throat. She had lived for many years with no symptoms from it.

Lingual goitre which, in our experience with more than 8500 patients with thyroid disease has occurred but twice, is obviously very rare. It may cause no trouble whatsoever. It may cause obstruction to breathing and swallowing and there is a remote possibility that it may be the seat of malignant degeneration.

In our experience with thyroglossal tract abnormalities, however, and in all the literature that we know, only one case of thyroglossal tract malignancy has been proved, so that even this possibility is doubtless quite remote.

As Dr. Miller has said, the removal of a lingual goitre is not difficult though I think we anticipated, if I recall it correctly, that we would have a great deal of trouble; nevertheless it was, as I remember it, with surprising ease that the base of the tongue was pulled up. The hemorrhage was controlled with ligatures, and the tumor was peeled out.

DR. FRANK H. LAHEY, Boston, Mass.: I would not say a word about this if I did not feel that we had had some experience which would be helpful. That is the lateral aberrant thyroid. Dr. Cattell has written about the lateral aberrant thyroids and I think anybody who is not already familiar with the type of tumor which arises in lateral aberrant thyroids would be interested.

These lateral aberrant thyroid masses arise from the ultimo-branchial bodies. These are peculiar tumors. You will be surprised to find that they look like melanotic sarcomas, bluish black in color, very soft, running up each side of the internal jugular vein, papilliferous in character, very sensitive to radiation, but a definite number of them become malignant. If you encounter these bluish black tumors running up and down in a chain beside the internal jugular gland, they are papilliferous aberrant thyroids and they should be taken out radically.

DR. RICHARD MILLER (closing): I was so impressed with the necessity for hurry that I left out a great deal.

Our resident in the Thyroid Clinic said we need not start thyroid extract for several weeks and I was surprised and a little disturbed, for fear of delaying too long. We did not give her thyroid extract in the hospital but sent her home without it, and she came back at the end of two months with a metabolism of minus thirty; then she came back again in three months at which time it was minus thirty-five, and it varied from then on from thirty-five to forty minus.

We took her into the hospital and gave her thyroid and it came back to normal shortly.

DEDICATION OF THE SEVENTH HEALTH UNIT

On Friday morning, February 24, at 11 o'clock the dedicatory exercises of the Seventh Health Unit of the City of Boston were conducted in the recently completed building of this Unit on Whittier Street, Roxbury, Mass.

The exercises were presided over by Edward L. Logan, Manager of the George Robert White Fund, under the following Trustees: The Honorable James M. Curley, Mayor of Boston, Chairman; Joseph McGrath, President of the City Council; Rupert S. Carven, City Auditor; Frederic S. Snyder, President of the Chamber of Commerce; and Robert G. Dodge, President of the Bar Association of the City of Boston.

A large number of Roxbury people who are interested in the Unit, as well as health administrators, physicians and philanthropists, were in attendance.

The meeting was called to order promptly and a brief explanation of the purposes of the administrators of the Fund was presented by Mr. Logan, who in turn called upon the Reverend William T. Deasy, Pastor of St. Francis De Sales Church, to give the invocation.

Mr. Francis V. Bulfinch of Coolidge, Shepley, Bulfinch & Abbott presented the keys to Mr. Robert G. Dodge, representing the Trustees. He in turn presented them to Mr. Joseph McGrath, Acting Mayor, in the absence of His Honor, James M. Curley.

Dr. Francis X. Mahoney, Health Commissioner of the City of Boston, gave a brief outline of the functions of the Unit stressing particularly the fact that the most important of its functions was that of caring for the health of the people and their instruction in the problems of preventive medicine. He made it clear that people are not expected to go to the Unit when ill, but that in case of emergencies, nurses or physicians would be sent to the homes to determine the necessity of care under the administration of the Unit. He explained that, although the Unit had been created under the administration of the Trustees of the White Fund, the expenses of maintenance would be borne by the City of Boston.

Dr. Mahoney was followed by Dr. Charles F. Wilinsky, Deputy Health Commissioner in Charge of the Health Units, who gave a clear account of the establishment of these centers under the George Robert White Fund beginning with the Institution on Blossom Street and referring to several centers preceding this seventh one. Dr. Wilinsky showed the benefit of experience in that the first unit cost nearly twice as much as the last one of the series which, although much more elaborate and with larger surroundings, was planned that it might be more adaptable to the functions of such a health center. These seven units have been paid for by the Fund at an expense of $2,800,000. So far as present indications reveal, there will probably be no necessity for further extensions. Dr. Wilinsky paid warm tribute to the Trustees, especially to Mayor Curley, for assistance in the planning and arrangement for the completion of this series and explained that the City of Boston will now provide about $20,000 each year for the maintenance of each of the units.

Dr. Wilinsky's remarks were followed by the Dedicatory Address of Dr. Shirley W. Wynne, Health Commissioner of the City of New York, who explained the public health activities of the largest city in this Country and graciously praised the work which has been done in Boston.

"From this," he said, "the City of New York has been able to learn many practical methods of health administration."

His address was a very full exposition of the problems of public health activities in a large municipality and was particularly interesting to the audience.

Dr. Wilinsky entertained Dr. Wynne the evening preceding the exercises, at an elaborate dinner to which many prominent people were invited.

The completion of this series of health units marks a very important step in the public health policies of the City of Boston and this unit will participate in a demonstration of the public spirit of those interested in promoting the work of the institutions in this City.

ASYMPTOMATIC PERMANENT COLLAPSE OF A PULMONARY LOBE WITH RESIDUAL INFECTION*

BY PERCY B. DAVIDSON, M.D.,† AND LOUIS M. FREEDMAN, M.D.‡

THE following case is presented as of special interest, because of the increasing evidence bearing on the relationship of pulmonary lobar collapse to lung disease in the acute and chronic states. This particular case is illustrative of the end result of a pneumonic condition with fibrosis and collapse, making impossible the return to normal function.

On December 21, 1927, a woman, 43 years of age, married, of Russian Jewish ancestry, presented herself because of "dizziness, headache, vomiting, irritability and constipation". She dated the onset of her present illness one and one-half years before her first visit when, subsequent to a fright, she became dizzy, vomited, had headaches and became constipated. When her bowels moved, her dejecta were full of mucus. Since then her symptoms had become increasingly more severe.

Her family history was not noteworthy. She had been married for twenty-two years and had never been pregnant. Her past history showed only one significant feature. That feature was that she had "lung disease" twenty-five years ago which had an acute onset and lasted for several months. There was no history which related her present symptoms to that previous lung condition.

On physical examination, the patient presented the following features: fair development and nutrition, temperature 99.4°, pulse rate 104, respiration 22, blood pressure 128/80, slight exophthalmos, thyroid definitely enlarged, questionable lid-lag and tremor of extended fingers, no breath sounds heard over lower chest, friction rub over left back, heart left border to left axillary line and right border to the left of the sternum, and abdomen essentially negative.

Laboratory studies showed the following: urine negative for sugar, albumen, and for microscopic findings; stools negative for blood and parasites but containing some mucus; basal metabolism within normal limits; blood morphology not unusual, blood Wassermann negative; sputum negative for tubercle bacilli, and gastric analysis showing a moderate hyperacidity.

X-ray examinations disclosed the following: Fluoroscopy and roentgenograms of the chest showed the heart occupying the greater part of the left chest without visualization of the upper border of the left diaphragm; the trachea arched over to the left; no evidence of tuberculosis could be seen stereoscopically in the right lung or that portion of the left which was clear. (Plate I.)

Gastro-intestinal x-rays showed marked tortuosity of the esophagus, with arching to the left (Plate II), a normal stomach and duodenum, and a spastic colon. The gall bladder filled and emptied normally after the Graham test.

After these initial studies, it was felt that the patient had two pathological conditions: one, the digestive aspect, that of mucous colitis, and the other, lung pathology, probably collapse of the lower lobe with displacement of the heart toward the affected side. The patient was then hospitalized for further study, particularly bronchoscopy.

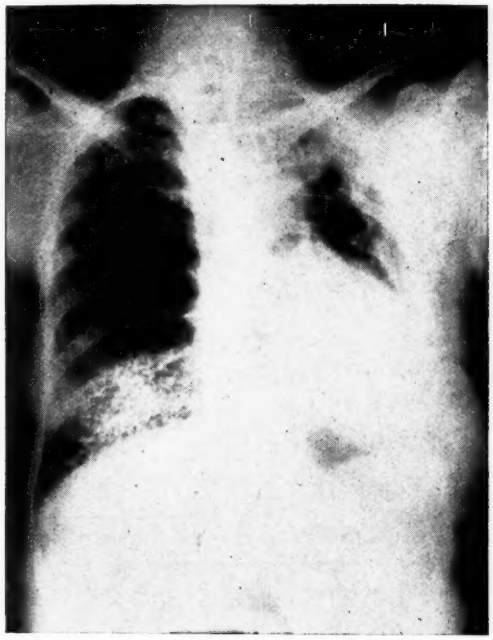

PLATE I.

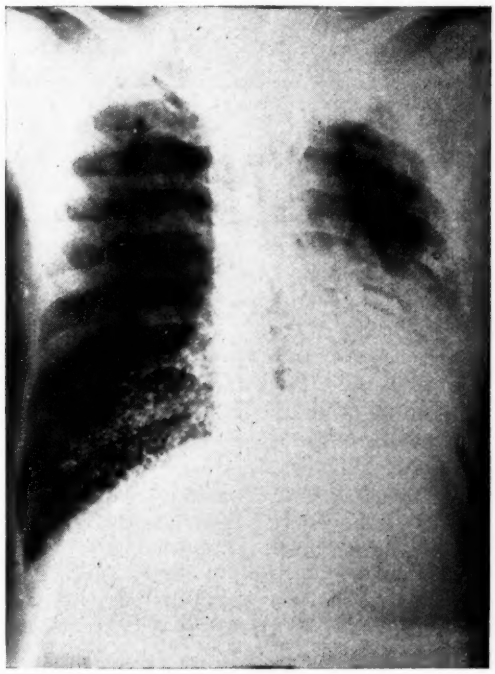

PLATE II.

Bronchoscopic examination was easily carried out. The main bronchus was normal and nothing exceptional was noted. The carina was reached and the right bronchus was entered as the only apparent

*From the Beth Israel Hospital, Boston.

†Davidson—Deceased April 29, 1932. For record see "This Week's Issue," page 504.

‡Freedman—Visiting Surgeon for Diseases of Ear, Nose and Throat, Boston City Hospital. For record and address of author see "This Week's Issue," page 504.

continuation of the bronchus. With the bronchoscope turned to the left an almost collapsed left bronchial opening was found, smaller in caliber than normal—too small to admit a seven mm. bronchoscope. Some mucopurulent secretion could be seen lower down through the opening. About 15 cc. of lipiodol was injected without pressure into each bronchus. X-ray examination following this showed the right lower lobe with normal filling, but the left lower lobe was evidently atelectatic and surrounded by considerable pleural reaction. (Plates II and III.) In view of the history of pulmonary infection, this atelectasis was interpreted to be a subsequent result of unresolved pneumonia and its ensuing fibrosis.

PLATE III.

Although the pulmonary condition did not give rise to prominent symptoms, it was thought best to treat her by postural drainage. The digestive situation was handled by antispasmodics, a low residue diet, and psychotherapy with marked relief.

DISCUSSION

The history, and physical, roentgen, and bronchoscopic findings suggest pulmonary collapse subsequent to residual pulmonary infection, probably an unresolved pneumonia with final fibrosis making it impossible for the lung to return to normal. At present, while the patient has no noteworthy symptoms from her pulmonary condition, it can still be interpreted as a focus of infection.

Because of the prevalence of collapse of an entire lung postoperatively, one tends not to expect collapse of single lobes. Yet in Ball's[1] series of four cases following thyroidectomy, single lobes were involved in two, and in Sante's[2] extensive article on the roentgen features, he emphasizes the possibility of collapse of single or multiple lobes in the postoperative group. The Chevalier Jackson group of bronchoscopists have emphasized lobar collapse by foreign bodies and mucous plugs of individual bronchi as causes of chronic atelectasis.

It seems rather likely that the mechanism in this case is a complex one. The secretion of the infected lobe may have become tenacious and acted as a plug in the bronchus, as in cases reported by Tucker[3]. In addition a collapsed lung tends to become rapidly fibrotic and non-expansile[4, 5], and when infected is likely to be even less expansile than the normal collapsed lung, as is suggested by Packard[6], and Tidy and Phillips[7]. The possibility of a stricture of the bronchus secondary to the infection being a factor is also noteworthy[6].

Chronic collapse of single lobes has been reported as due to many possible factors, some within and some without the bronchus. Brenneman[8] mentions cases following tonsillectomy, presumably from aspiration. Packard[6] demonstrates collapse of the lung due to fibrosis of the bronchus and enlarged tracheo-bronchial lymph glands. Junghagen[9] likewise called attention to atelectasis caused by enlarged glands.

This case above reported would seem to point out the desirability of early bronchoscopy in cases of "unresolved pneumonia". A tenacious mucous plug may bring about the process, or as not infrequently happens a non-opaque foreign body may be the responsible factor.

SUMMARY

1. A case of pulmonary lobe collapse of 25 years' duration without referable symptoms is reported.
2. The history, bronchoscopy and roentgen findings suggest that the primary condition was an unresolved pneumonia.
3. The varied etiology for chronic pulmonary collapse and the necessity of complete studies are emphasized.
4. Early bronchoscopic examination in unresolved pneumonia is stressed.

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THE PRESENT STATUS OF BISMARSEN IN THE TREATMENT OF SYPHILIS

BY HARRY BECKMAN, M.D.*

THIS new drug is the sodium salt of a bismuth derivative of arsphenamine methylene sulphonic acid with inorganic salts. Its production is the result of a very rational attempt to make available in one compound which may be given intramuscularly the therapeutic properties of arsenic, of which it contains about 13 per cent, and bismuth, in which its content is about 24 per cent. Since late in 1927 certain indications of its usefulness and limitations have been accumulating, so that the following summary of its status may now be offered.

ADMINISTRATION AND DOSAGE

Bismarsen is a brownish yellow, readily soluble powder, the single dose of which is dissolved in the ampule, just before using, in 2 cc. of sterile distilled water to which is added 2 to 4 minims (0.12 to 0.24 cc.) of 2 per cent butyn solution for anesthetic effect. The drug is very stable and uniform. The injections are made intramuscularly just as with bismuth or mercury, taking the same care to avoid entering blood vessels. The usual adult dose at each injection is 0.2 gram, but Stokes[1, 2] gives only 0.1 Gm. at the first injection. The several experimenters with the drug have been injecting at various intervals and with varying numbers of injections constituting a course: (a) 20 injections, twice a week[1, 2]; (b) 20, once a week[1, 2, 3]; (c) 20, more or less three times a week[4]; (d) 10, at five to seven day intervals[5]; (e) 8, at intervals of four days[6]. The details of these various practices will be developed in what follows, but it can already be seen that the drug is hardly ideally suited to private office practice or even to use on a very large scale in the clinic. There have been administered in the different series from one to five courses with rest periods of two to four weeks, or in some instances with no rest periods at all.

BISMARSEN IN EARLY SYPHILIS

Stokes, Miller and Beerman[2] believe after their five years' experience with the drug that its ultimate curative effect in early syphilis is equal and even superior to that of other standard treatments with arsphenamines combined with mercury or bismuth. I shall consider their evidence together with that presented in the other outstanding reports. (*a*) *Spirillicidal effect.*—In the original report of Stokes and Chambers[1], in 1927, it was said that spirochetes disappeared from the primary lesions in 25 to 33 hours, but subsequent observers have not been able to duplicate these results; all[5, 6, 7] have reported the disappearance to occur more slowly than with arsphenamine or neoarsphenamine. (*b*) *Effect on Wassermann reaction.*—Kolmer[5] gave very thorough treatment (4 courses of ten 0.2 Gm. doses at five to seven day intervals, length of rest periods not stated) to four seronegative primary cases. After periods of eleven months to three and one-half years, all still remain seronegative. Shivers[7], using courses of 20 weekly 0.2 Gm. doses, was able to keep all of his six seronegative primary cases continuously negative. Of Stokes' four cases given 20 injections of 0.2 Gm. (the first, 0.1 Gm.) at the rate of one or two, mostly one, per week, three never became seropositive and the other one became seropositive after nine injections. O'Leary and Brunsting[8] treated six seronegative primary cases with four courses (4 weeks' rest periods) of eight injections of 0.2 Gm. at four day intervals. All have remained negative for several years. It is therefore apparent that bismarsen is effective in "curing" seronegative primary syphilis. In Shivers 13 cases of seropositive primary syphilis, an average of 20 injections was required to render the Wassermann negative, and there was one failure; this is about what was accomplished by the other observers, for out of a total of 131 cases reported[1, 2, 3, 5, 9] as seropositive primary, 118 were rendered negative by from 8 to 40 injections—the average was probably about 20, though it is not possible to arrive accurately at this figure. (*c*) *Effect on spinal fluid*—O'Leary found four abnormal fluids in 30 cases after treatment, Kolmer one in 11, Stokes two in 11. None of O'Leary's nine patients with asymptomatic neurosyphilis when first seen in acute syphilis showed any improvement in the condition of the spinal fluid under treatment. (*d*) *Effect on healing of primary and secondary lesions.*—All observers[1, 2, 4, 5, 6, 7, 9] are in agreement that healing of the primary sore, and of the condylomas, mucous patches, macular, papular, etc., syphilids of the secondary stage proceeds considerably slower under bismarsen than under arsphenamine or neoarsphenamine. In the series of Stokes, who has probably had the largest experience, healing of the primary lesion occurred between the fifth and thirteenth injections, and involution of the secondary lesions between the second and fifteenth injections according to type, but in 23 of the 25 secondary cases there was healing by the eighth and in 16 cases by the fifth injection. Kolmer believes that it is not the drug of choice unless intravenous medication is impossible, and Shivers favors its use as a second course after 20 injections each of

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neoarsphenamine and a bismuth preparation. (*e*) *Relapse under treatment.*—The incidence of relapse in patients observed six months or more after treatment was 12 per cent in Stokes series of 50 cases, but since not all patients had examinations of spinal fluid, these figures are valid only for blood serologic findings and clinical evidences. In O'Leary's 30 cases the percentage was 16.6, but when the series was reëxamined after a longer period of time the percentage of relapses was found to have risen to 30, and among the 14 patients with seropositive primary syphilis when treatment was begun, seven, or 50 per cent, had relapsed in one form or other. Stokes suggests that shorter intervals between injections (2 per week instead of 1), and no rest periods until as near 40 injections as possible have been given, would increase the effectiveness of the therapy even though the total length of the full treatment would be thus curtailed. Thirty-two of his patients had absolutely continuous treatment (60 per cent received 20 injections or less) and twenty-one had rests or lapses (86 per cent had twenty-one or more injections, 40 per cent had over forty); the numbers are small for conclusions, yet significantly fewer relapses occurred in the continuously treated group than in the other. However, O'Leary[8], who was once quite favorably inclined toward the drug, now rejects it on the basis of a higher proportion of relapses, particularly in the nervous system, than under other types of treatment; even the decreasing of the rest period to two weeks and giving a minimum of 40 injections have not caused any obvious change in the results. Apparently, then, bismarsen, in the small number of cases in which it has been used, has not definitely established itself the equal of the arsphenamines and mercury in preventing relapse in seropositive primary and secondary cases, for by the use of the older drugs in some such system as that employed at the Johns Hopkins Hospital[10], relapse occurs in only from 23 to 40 per cent of cases. Kolmer believes that bismarsen is not the drug of choice in early syphilis.

BISMARSEN IN LATE SYPHILIS

In Stokes' 35 cases of cutaneous, mucosal, osseous and rectal gummata, involution of the lesions was accomplished quite slowly in comparison with other methods of treatment. This was Kolmer's experience also. Stokes feels that when rapid healing is desired other drugs should be used, but Kolmer, who favors a combination therapy in chronic syphilis, looks very favorably upon bismarsen as a drug with which to begin treatment because, being given intramuscularly, it has enabled him to avoid the acute exacerbations (all observers have remarked upon this absence of Herxheimer reactions) which sometimes follows the intravenous injection of the arsphenamines, and also because with it one is enabled to determine the tolerance for arsenic of a patient who is resuming treatment after a long rest when hypersensitiveness may have been induced by the earlier treatment, or in one who has been previously injured by the drug. Shivers considers it the drug of choice in all patients with late secondary syphilis, and he has been very well pleased with the effect upon late cutaneous syphilids in 60 cases, though he says nothing of the *rate* of involution. He also considers the drug superior to bismuth and much safer than the intravenous administration of arsenicals in cardiovascular syphilis. Stokes' results were also very good in cardiovascular syphilis but the findings were not conclusive in any type, except that in aortitis bismarsen was shown to be of equal value when given alone as when used in various combinations with mercury and iodides. Kolmer believes that for the two (at least) courses of treatment per year which he considers necessary in Wassermann-fast cases in order to maintain the latency as long as possible, bismarsen is particularly valuable, and expresses himself as having been frequently surprised by the reduction of serologic reactions to negative. However, both Elliott[8] and O'Leary considered their results unsatisfactory in this type of case. Stokes reversed the reaction to negative in seven of 15 cases, but since it was his observation that if the reversal is going to take place it occurs relatively early after the bismarsen injections have been begun, he is inclined to believe that the result is due more to the change of drug than to the number of injections. Courses: (a) Kolmer, ten injections of 0.2 Gm. at five to seven day intervals; (b) Stokes, 20 injections of 0.2 Gm. (first one, 0.1 Gm.) once, occasionally twice, a week; (c) Shivers rarely gave patients over forty years of age more than 0.1 Gm. once a week. All observers have remarked favorably upon the tonic effect of the drug, which is so important in chronic syphilis.

BISMARSEN IN NEUROSYPHILIS

In tabes dorsalis it was the experience of Tobias (20 cases), Hadden and Wilson[11] (31 cases), and Stokes (12 cases), that in most instances the lightning pains respond quite favorably to the drug, that there is less response of the ataxia, and no response of the optic atrophy. Shivers, as well as both Stokes and Kolmer, have been especially pleased with the relief of headache in cerebrospinal syphilis of the acute meningeal type. In cases other than those having a paretic formula, the blood and spinal fluid reactions were reduced to normal in about 50 per cent, but the number of patients thus studied is too small to permit the drawing of conclusions.

BISMARSEN IN CONGENITAL SYPHILIS

Chambers and Koetter[12] have recently reported upon the use of the drug in 180 patients ranging in age from birth to 14 years, the majority being more than three years old. The period of observation was from one and one-half to two and one-half years. Dosage: to a child of two weeks, 10 mg.; six to twelve weeks, 40 to 50 mg.; three to twelve months, 75 mg.; three to five years, 100 to 200 mg.; five to fourteen years, 200 mg. They believe the best treatment to consist in two injections weekly in courses of 20 injections, with rest-intervals of two weeks and a total of three courses. The active lesions were healed somewhat more slowly than with the other arsphenamines and the improvement in cases of interstitial keratitis also lagged. Kolmer's and Stokes' experiences were the same in regard to keratitis, but all the observers have found the ultimate results quite as good as those obtained with the older drugs. In 100 cases receiving the full three courses in Chambers and Koetter's series, 65 per cent showed complete reversal of the blood Wassermann, an excellent serologic result; of the remainder, 10 per cent belonged to the Wassermann-fast group before the treatment was begun. In the entire series only two abnormal spinal fluids were encountered and these were unaltered by treatment.

BISMARSEN REACTIONS

The local reactions of pain and stiffness, which are most marked on the second and third days, usually occur with the first five injections and are much reduced by massage. In Stokes' series such reactions occurred in 15.6 per cent of the patients between one and 20 years of age, 35.6 per cent between 21 and 40 years, 46.3 per cent between 41 and 60 years, and 57.1 per cent between 61 and 80 years. However, they followed only two per cent of the total of 7,666 injections. In the matter of general reactions in the combined series of Stokes, O'Leary, Chambers and Koetter, Elliott, and Kolmer, with a total of 17,460 injections, the following have been reported: nitritoid crises, 20; gastro-intestinal reactions, 20; exfoliative dermatitis, 2; miscellaneous skin reactions, 11; jaundice, 3; hemorrhagic purpura, 1 (but Stokes knew of three other instances not included in the series); bismuth line or stomatitis, 11; cerebral, neuritic or renal disturbances, none of moment. So far as one can determine from these figures, which still represent a limited experience, the drug has a low systemic toxicity, rather in the supposed range of neoarsphenamine than of old arsphenamine, but like the other sulphoxylate arsphenamines, including neoarsphenamine and sulpharsphenamine, it is capable of causing grave injury to the hematopoietic system. Furthermore, it cannot apparently safely be substituted for the other arsphenamines in cases in which specific sensitiveness to the arsphenamine radical has already been manifested by the occurrence of an exfoliative dermatitis. In other types of arsphenamine sensitiveness, such as nitritoid reactions, jaundice, skin reactions, pruritus and vomiting, Stokes has substituted it with remarkable success upon the whole. The frequency of exfoliative dermatitis caused *primarily* by bismarsen (once in 8,730 injections) compares very favorably with the rather out-of-date statistics of Meirowsky[13] for the other drugs: neoarsphenamine, once in 5,260; arsphenamine, once in 1,850; sulpharsphenamine (Stokes), once in 700.

SUMMARY

1. Bismarsen is slower than the older drugs in causing the disappearance of treponemata from primary lesions and also in bringing about the healing of both primary and secondary lesions. It is, however, apparently effective in "curing" seronegative primary syphilis, and compares very favorably with the older drugs in reducing seropositive primary cases to negative.

2. Bismarsen has not definitely established itself as equal to the older drugs in preventing relapse in seropositive primary and in secondary cases.

3. The healing of the lesions of tertiary syphilis is accomplished more slowly by bismarsen than by the older drugs, but an argument presented in its favor is that it provides a good means of testing the arsenic sensitiveness of patients who have had much previous treatment. The efficacy of the drug in reversing the blood-Wassermann reaction in chronic syphilis is not yet definitely determined, but it has undoubtedly an excellent tonic effect in these cases.

4. The pain in tabes dorsalis, and particularly the headache in acute meningeal syphilis, is often considerably relieved by bismarsen.

5. Cases of congenital syphilis with active lesions respond more slowly to bismarsen than to the older drugs, which is also true of cases of interstitial keratitis. The ultimate effects, however, and also the serum- reversal effect, are very satisfactory.

6. Local reactions of pain and stiffness follow about two per cent of the early injections in a course.

7. Bismarsen has apparently a lower systemic toxicity than arsphenamine, perhaps even than neoarsphenamine, and has been upon the whole satisfactorily substituted for the older drugs in cases of arsphenamine sensitiveness. However, it is capable of causing grave injury to the hematopoietic system, and it is also probable that it cannot be safely substituted for the older arsphenamines in instances where their use has given rise to an exfoliative dermatitis. The incidence of exfoliative dermatitis *primarily* caused by bismarsen is very low.

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DO OFFICIAL DEATH RATES FOR DIABETES, CANCER AND THE PUERPERAL STATE ACCURATELY REFLECT PRESENT CONDITIONS?

BY JAMES RAGLAN MILLER, M.D.*

"FEW persons not professional vital statisticians understand the real meaning of mortality statistics tabled under the International classification[1]."

The official death rates for diabetes showed a slight decrease for the first few years after the introduction of insulin, but a stationary condition for the past four or five years.

The death rate for cancer shows an alarming increase, and the puerperal mortality rate has shown little, if any, tendency to decline.

It is the purpose of this communication to emphasize the fallacy of relying upon official death rates as a basis for deductions which are unwarranted. Medical men generally know that the death rate from diabetic coma has been reduced until it is now, for example, only 10 per cent of the total diabetic death rate in Massachusetts.

Vital statisticians are not yet agreed as to the extent to which the increasing death rate in cancer is real or apparent. Arguments for both interpretations can be found in the writings of experienced students in this field.

Many experienced obstetricians refuse to believe that the actual number of deaths in childbirth is not less than formerly. They believe that the method of compiling the statistics, and other factors, tend to conceal what improvement has taken place[2, 3].

Recently in conversation with an authority in the field of diabetes, we were told that the modern treatment of diabetes has reduced the number of deaths to such an extent that diabetes can be considered scarcely more than a serious handicap. From one large clinic he showed that where similar age groups of diabetics and nondiabetics were compared, the mortality rate, year by year, was almost the same. In other words, the expectation of life, so far as his clinical experience was concerned, has been greatly increased for the diabetic.

Whether or not this optimistic view is wholly justified, it is common knowledge among physicians, that most patients who have diabetes do not die at present because of their diabetes.

Certainly the medical profession has ample justification for feeling that there is something wrong in answering the problem of end results, and even of life expectancy from the insurance standpoint, merely by the use of vital statistics which we have at present.

We were told by this same authority in diabetes that since the results of diabetes in well run hospitals is now so satisfactory, the results obtained by practitioners outside of these clinics must be very poor indeed, in order to explain the failure of the diabetic death rate to fall. He reasoned that this must be so since the same "Manual of Joint Causes" has been in use over this period of time, and the rules of tabulating diabetic deaths have not changed. Such reasoning we regard as faulty, and we would say that *because the same rules of classification are in force,* the diabetic death rate has not decreased.

Such faulty reasoning appears to us to reflect the widespread ignorance of the fundamental nature of vital statistics. Diabetes, perhaps more than any other condition, seldom appears alone on the death certificate. Before the use of insulin it was, in truth, a frequent primary cause of death, in other words, it was the diabetes which killed the patient. Today, it is frequently merely a condition which the patient is known to have had; a handicap which even to the point of death was under perfect control, and played little or no part in actually causing the death of the patient.

The "Manual of Joint Causes" is peculiar to the United States, being issued by the Census Bureau, to regulate in a uniform manner the tabulation of deaths according to a definite scheme. Other countries have sets of rules for the guidance of the registrar. These rules differ somewhat from each other, and from those in use in this country; in the United States,

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however, the Manual gives the registrar no latitude whatever. It tells him precisely which of two or more conditions he must record as primary, for example: A man dies of influenzal pneumonia, at autopsy a very early cancer of the kidney is found, this death will be recorded in our vital statistics as being caused by cancer.

It will surprise most physicians to learn the extent to which diabetes takes precedence over other causes of death which appear on the death certificate. If diabetes is mentioned, even as a secondary cause, together with any of the diagnoses in the following list, diabetes will get the credit for "causing the death".

Erysipelas
Lethargic encephalitis
Purulent infection, septicemia
Acute rheumatic fever
Alcoholism
Encephalitis
Epilepsy
Convulsions, non-puerperal, 5 years and over
Pericarditis
Other diseases of the heart
Lobar Pneumonia
Appendicitis
Acute nephritis*

The fundamental considerations involved will be clear from the following quotation from Raymond Pearl[1].

"Philosophically considered a true determination of the 'cause of death' is in a great many cases, indeed the majority probably of all cases, an extraordinarily difficult matter. This every pathologic anatomist knows. The difficulty arises from many different circumstances. Some illustrations will make the point clear. A person has cancer of the breast, is operated upon in the hope of curing this disease, develops a postoperative pneumonia, and dies. Now if the person had not had the cancer and had therefore not been operated on for its relief, she would not have died when she did. This way of looking at the matter plainly suggests that the cancer is fundamentally the cause of this death. On the other hand, if she had not been operated on, even though she still had the cancer, she would not have died when she did, but at some later time. This view rather tends to make the operation the cause of death, at least at the particular time and place at which it occurred. Again, suppose she had been operated on, and had not developed the postoperative pneumonia. Then she might have been permanently cured of the cancer (many are) and lived to a ripe old age. This view of the case truly makes the pneumonia the cause of death. Which of the three things—cancer, operation, or pneumonia—is to be charged as the primary cause of death plainly depends upon the point of view, or, put in another way, upon what definitions or rules are set up as to what shall be called the cause of death.

"As has already been shown, official vital statistics operate under such a set of rules. In the case cited, cancer would be given as the primary cause of death, and the postoperative pneumonia as the secondary or complicating cause. To the philosophic mind this is probably the least satisfactory solution of the three. Why it is the officially chosen one is because of an often overlooked, and in some of its aspects quite vicious, underlying concept in official vital statistics. *There is ever present in vital statistics, and from the beginning always has been, an attempt to make the incidence of mortality a measure or index of the incidence of morbidity.* Mortality is not and never can be a good index of morbidity, generally speaking. What actually is done is to weaken and impair the value of the statistics for the study of mortality in the hope of making them a little better indices of morbidity. This tendency is apparent in the illustration given above. It is thought desirable to get as complete records as possible of the prevalence of cancer in the population, as a disease. Therefore, the rule is that, in general, if a person dies who is known to have had cancer prior to death, the death is to be charged to cancer. In consequence, it results that no one can get from the official statistics an accurate answer to the question: 'How many persons per thousand living did cancer kill in 1920?' Instead, what he gets is information as to how many persons died per thousand living in 1920, who had had cancer before they died. The latter information, as anyone with a logical mind will at once perceive, is quite different from the former."

These matters are understood by biometricians, and it is possible that the "Manual of Joint Causes" which is soon to be revised will take into consideration the changes which have come about in diabetes therapy, as indeed, the new International list itself has partly corrected the fallacies in the puerperal enumeration.

The purpose of this communication therefore is to familiarize physicians with the fallacy of thinking that mortality rates mean what they seem to mean.

Statistics do not lie, but they are frequently misinterpreted.

Some physicians are already solving this problem by omitting the diagnosis of diabetes in cases where they are certain it was not a real factor in the cause of death. This solution of the problem is not to be recommended.

*Et cetera to the number of one hundred and thirteen diseases. The entire list can be found in the "Manual of Joint Causes", issue 1925, Bureau of the Census.

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MEDICAL PROGRESS

RECENT PROGRESS IN PHYSIOLOGY

BY PERCY G. STILES, PH.D.*

CARBON Monoxide. Studies reported by Fenn and Cobb[1] tend to change the views we have commonly held in regard to the properties of this gas. We know too well that it is lethal when inhaled even in very low concentration. Yet we are told that it is not definitely poisonous to all tissues. The painstaking analyses of Fenn and Cobb show that the skeletal muscle of the frog can metabolize the monoxide on a fairly liberal scale, burning it to carbon dioxide as though it were a fragment of an organic molecule. For a muscle exposed to gas mixtures in which the partial pressure of carbon monoxide is high, there is an actual increase in oxidation over the rate in air.

It may be inferred that the fatal effect of carbon monoxide on the higher animals is indirect. As it engages the hemoglobin in a stable combination it diminishes the oxygen capacity of the blood. The tissues suffer from anoxemia. Carbon monoxide itself scarcely reaches them; it has little tendency to escape from the blood. If it could be offered freely to the contractile cells they might in fact profit by it in some degree. It is true that carbon monoxide interferes with respiratory processes in certain cases in which hemoglobin is not involved. Thus it is toxic to yeast. We have proof, however, that it is not universally antagonistic to biological oxidation like the cyanides. The suggestion has been made that its effect on yeast is due to its union with some catalyst which it cripples for service much as it does hemoglobin.

The Carotid Sinus. For several years this structure has been the object of extended investigation. The chief emphasis has been upon its responsiveness to changes in arterial pressure and the part it may be held to play in limiting such fluctuations. It has been made to appear as a kind of safety device checking the excursions of blood pressure so that deviations from the mean shall not be excessive. Sensory endings are obviously present in the walls of the sinus which are responsive to mechanical stimulation. These communicate with the medullary centers through which both cardiac and vasomotor reflexes are mediated. The adjustments effected are similar in principle to those long pictured as resulting from varying distention of the aortic arch.

Evidence has been secured that the carotid sinus contains chemical as well as mechanical receptors. Changes in the composition of the blood passing through this arterial segment may alter the rate and depth of breathing. When the nervous connections of the sinus are severed this sensitiveness is destroyed. On the basis of facts like these, certain Belgian physiologists have inferred that the chief control of breathing may be localized at this place. The respiratory center long conceived to exist in the medulla is thus reduced to a mechanism of minor importance. An elaborate study by Schmidt[2] has led him to conclusions somewhat less radical.

Experiment shows that many respiratory reflexes are in fact obtainable from the sinus. The effective stimuli may be either mechanical or chemical. As a rule it is found that elevation of pressure within the sinus depresses the breathing. This is in accord with the Belgian data. As to the influence of changing the gaseous content of the blood there are new findings. Schmidt has been at pains to discover by definitive trials the difference between the reaction to increased carbon dioxide and to diminished oxygen. In normal life the two departures from normal are likely to occur together. The effect of such variations as brought to bear upon the sinus is unequal.

The method most used consisted in perfusion of the sinus in one animal with blood diverted from a second. The donor breathed gas mixtures determined at will by the investigator. Thus the blood transmitted to the recipient could be made poor in oxygen or, again, overcharged with carbon dioxide. Perfusion of the sinus with oxygen-poor blood strongly stimulated breathing. On the other hand the carbon dioxide in the perfusing blood could be much increased without evoking such a response. Schmidt believes that the sinus is not of the foremost importance in regulating the ventilation of the lungs. We are not compelled to abandon the conception of a medullary center the cells of which are exquisitely sensitive to slight changes in carbon dioxide tension or hydrogen ion concentration. When, however, breathing is increased with oxygen want, as at high altitudes, we may be witnessing a reaction in which the chemical receptors of the sinus have a part.

Nervous Control of the Thyroid. Much remains to be determined as to the degree of government exercised by the nervous system over the glands of internal secretion. For some time it has been clear that the adrenal medulla is subject to regulation through the splanchnic. The vagus probably contains fibers affecting the activities of the island cells of the pancreas. Much difficulty has been experienced in clearing up

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the facts about the thyroid. It may be recalled that Cannon, Binger and Fitz[3] reported a remarkable experiment bearing on this matter as long ago as 1914. They sutured the central end of a cut phrenic nerve to the cephalic part of the cervical sympathetic in a cat. With this union established it was considered possible that the impulses formerly sent to the diaphragm in the rhythm of breathing might now be conducted to structures innervated by the sympathetic. Among these would be the thyroid.

In one animal the irritation of the thyroid appeared in a striking manner. A typical hyperthyroid condition developed with intensified metabolism, loss of weight, and nervous instability. At autopsy the thyroid was found markedly hypertrophied on the operated side. Since it proved difficult to repeat the experiment, the positive findings were not stressed. They now seem fully validated by the work of Haney[4].

The procedure has been to expose and cut the cervical sympathetic nerves in rabbits. The head ends of the nerves have been subjected to faradic stimulation for long periods—up to three hours. The animals have afterward shown a heightened metabolism beginning on the second day, reaching a high point in from 11 to 15 days and very gradually declining to the initial level. At the peak the metabolic rate has been about 29 per cent above normal and the return to the original standard has sometimes required two months. It is clear that the thyroid is responsible; the stimulation is without effect if the gland has been previously removed.

Muscle Contraction. Interpretation of the chemical reactions furnishing the energy of muscle contraction has tended to undergo radical changes in the past few years. So great a master in this field as A. V. Hill has felt warranted in speaking of "the revolution" in muscle physiology[5]. The subject cannot be treated adequately in short compass, but neither can it be wholly ignored. Reviewing the unfolding of the doctrine one may recognize three epochs. During the first of these a muscle was regarded as a thermodynamic engine burning fuel in response to a stimulus, generating heat, and transforming this heat in part to mechanical tension. It was thus closely comparable with an ordinary steam engine and oxygen was necessary for each act of contraction.

Throughout a second period, which appears now definitely ended, it was taught that the energy of working muscle is liberated in connection with the transformation of glycogen to lactic acid. Intermediate stages were postulated as well as secondary reactions between the acid and other compounds. These changes could run their course in the absence of any oxygen supply. The oxidation normally going on in muscle was valuable as furnishing the energy needed to reconstitute the glycogen for later service. The muscle no longer suggested a steam engine by itself but a motor with a storage battery to run it and an engine to recharge the battery from time to time.

It is now established that under certain experimental conditions a muscle may perform work without production of lactic acid. The source of energy appears to be the disruption of a compound yielding creatin and phosphoric acid. The amount of this newly discovered "explosive", spoken of as phosphagen, is quite limited. Nevertheless it is probably the normal ammunition of the muscle. It undergoes cleavage when the equilibrium of the tissue is upset by stimulation, energy becomes kinetic and is applied to the development of tension. To renew the working capacity of the muscle the phosphagen must be resynthesized, an endothermic process. The driving power is obtained by the breakdown of glycogen. Finally, if oxygen is available, fuel is burned and energy is afforded for the rebuilding of the carbohydrate.

Mechanical analogies now begin to seem farfetched and unsatisfactory. If we are to parallel the triple phase process we must resort to something like the following. The steam engine charges the battery and the battery operates the motor (this was the old schema) but the motor does not directly produce the final effect. Instead, the power of the motor is used to wind up a clock-work and it is from this secondary accumulator that the external work is at last derived. One is reminded of the "House that Jack built." Hill reminds us that we must await with open minds additional complications which will surely be brought to light.

Fasting and Muscular Endurance. A study made by Leese, Hines and Jordan[6] is of interest. They have withheld food from rats for various periods up to six days. The animals have then been anesthetized with amytal and direct stimulation of the gastrocnemius carried on. Using strong induction shocks (frequency 2 or 3 per second) it was found that the muscle would generally respond from 60,000 to 100,000 times before becoming exhausted. These prodigious performances were not reduced by fasting. Six days is a long fast for a rat and would be expected to result in great prostration. The conclusion is favored that the weakness of human subjects deprived of food is a nervous rather than a muscular phenomenon.

The Spleen. The conception that the spleen is important as a reservoir for blood has been made familiar especially by the observations of Barcroft. Reference may be made to an elaborate paper by Henschen and Reissinger[7] as giving an idea of the scale on which this adjunct to the circulation operates. The experiments were upon dogs. It is reported that the spleen after death from hemorrhage has only one-fourth the volume it had in life. The blood expressed from the organ in contracting to this extent is esti-

mated to be eight per cent of the total in the body. As to the red corpuscles turned into the stream at such a time the percentage is doubtless even greater for the concentration of erythrocytes in the splenic blood is disproportionately high. The extreme range of variation in the volume of the spleen was found to be in one case from 63 to 750 cc. The latter figure was close to the point of rupture.

The Metabolism of Nerve. This subject has been very fully covered by a recent review (Gerard[8]). It is only within a few years that sufficiently delicate methods have been available for attacking the problem. It used to be stated that nerve-trunks had no measurable respiratory exchange and produced no demonstrable heat. It remains a fact that the processes characteristic of such tissue are marvelously economical, but they can now be quite accurately estimated. We must bear in mind that the axis-cylinders of a nerve constitute but a small part of its mass. The bulk of the trunk is made up of sheaths and connective tissue in which little activity is to be expected. Even in the axis-cylinders themselves it is probable that metabolic changes are limited to a thin surface stratum.

Gerard points out that skeletal muscle as well as nerve has a minimal respiration when at rest. The two have a rather similar rate of gaseous exchange when unstimulated. But when muscle is thrown into contraction its metabolism is multiplied several thousand-fold; the corresponding increase in nerve under excitation is of the order of a doubling. The two present an extraordinary contrast. While the expenditure attending activity in nerve is slight the chemical processes of recovery are gradual and prolonged. In spite of this we know that the capacity to repeat the act of conduction returns after the briefest refractory period.

In nerve as in muscle there may be some formation of lactic acid when oxidation does not keep pace with the needs of the tissue. In muscle such lactic acid normally disappears when the oxygen supply becomes adequate; for the most part it is resynthesized into glycogen or a related compound. Lactic acid in nerve is not resynthesized but must, presumably, be carried away by the circulation. There is evidence of a reserve substance in nerve which can furnish oxygen and thus support metabolic reactions in which carbon dioxide is produced. At the beginning of the century there was a widespread belief in the existence of such a store of "intramolecular oxygen" in muscle but this has long since been set aside.

Sleep and the Cerebral Cortex. Among the observations reported by Goltz in his classic study of the decerebrate dog (forty years ago) was the unexpected one that the animal still seemed to wake and sleep by turns. It was natural to assume that all its activities must be subconscious: its "waking" was to somnambulism rather than to an appreciation of its surroundings. We feel assured that in man the paralysis of the cortex without functional changes at lower levels would suffice to produce the lapse from consciousness which is central in our concept of sleep. We tend to overstress the subjective and need to consider that there are changes in posture, tonus, vasomotor balance, secretion, etc., which enter into the picture. These indicate subcortical features in the nervous readjustments for the sleeping state.

The decerebrate—or at least, decorticate—mammal is no longer, as in the days of Goltz, a rare achievement of surgery. Kleitman[9] has carefully observed the behavior of decorticate dogs with especial reference to sleep. The earlier statements are confirmed: the animals retire to corners, curl up, and with closed eyes give the impression of being asleep. Some roughness is required to arouse them. A significant difference between these and normal animals is found in the fact that their periods of sleep and waking are short; by night as well as by day there are frequent alternations. It is pointed out that short periods like these, uninfluenced by light and darkness, are characteristic of young animals and of the human infant.

The newborn baby or the puppy is in a condition little removed from the decorticate. The cortex intervenes in the nervous reactions to an increasing degree with the passage of time and more or less proportionally to the use of the eye and ear. Sleep tends to be postponed when stimuli are playing upon these sense-organs and is favored when darkness and silence leave them undisturbed. Using Kleitman's terminology one may say that sleep in the absence of the cortex so breaks into the day as to make it "polyphasic" while the cerebral influence, superimposed, determines the "diphasic" division of the twenty-four hours. In old age, as in infancy, the cortex loses in some measure its dominance and again the polyphasic rhythm may be noted.

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CASE RECORDS
of the
MASSACHUSETTS GENERAL HOSPITAL

ANTE MORTEM AND POST MORTEM RECORDS AS USED IN WEEKLY CLINICAL-PATHOLOGIC EXERCISES

EDITED BY RICHARD C. CABOT, M.D.
F. M. PAINTER, A.B., ASSISTANT EDITOR

CASE 19091

AN ABDOMINAL EMERGENCY WITH VOMITING AND EPIGASTRIC PAIN IN A WOMAN OF SEVENTY-SEVEN

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. BENJAMIN WOOD*: This is the case of a seventy-seven year old white American woman who entered through the Emergency Ward. The chief complaints were vomiting and abdominal pain of one week's duration.

Previous to a week before admission she had been well. Then she was suddenly seized with pain in the epigastrium, not especially severe but remaining constant for three days. She had increasing nausea and vomiting. The vomitus resembled coffee grounds. Four days before entry she had sharp pain in the right lower quadrant, where it persisted until admission. The vomiting became very pronounced; for three days she was unable to keep anything down. The pain in the right lower quadrant had never been colicky. There was no jaundice. She had daily bowel movements during the week, and several enemas. No abnormality was noted in the stools. For many years she had had mild indigestion but no constipation.

The past history showed nothing of importance. She had had some dyspnea on exertion and slept on two pillows, but had no other symptoms referable to the cardiovascular system. Her appetite had been good. There had been no loss of weight. There were no genito-urinary symptoms.

Physical examination showed a very obese old lady lying flat in bed. There was marked cyanosis of the lips. The size of the heart was difficult to determine. The rate was normal. An occasional extrasystole was heard. The blood pressure was 170/100. There was slight edema of the ankles. The abdomen was distended and tympanitic, with slight spasm and tenderness in the right lower quadrant. No masses were made out. Rectal and vaginal examinations were negative. The white cell count in the Emergency Ward was 10,800. The urine was negative except for an occasional white cell in the sediment and rare red cells.

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She was sent immediately to the operating room, where an exploratory laparotomy was done. After operation the patient was in very poor condition from a cardiovascular standpoint. She became intensely cyanotic and was put in an oxygen tent with no improvement. She did not regain consciousness after operation. The lungs filled with moist râles. The next morning she died.

CLINICAL DISCUSSION

DR. WOOD: On opening the abdominal cavity the small intestine was found to be greatly dilated and a gall stone which is described as being the size of a small squash ball, i.e., about four centimeters in diameter, was found obstructing the ileum. The bowel was red and showed several large patches of fibrin.

The diagnosis was intestinal obstruction from an impacted gall stone in the jejunum and hypertensive heart disease with failure.

DR. ERNEST M. DALAND: The most striking thing on physical examination was the distention and the localized tenderness in the right lower quadrant. I was inclined to think it had something to do with the appendix. When I told the patient that I thought she had trouble with her appendix she said, "I'll bet you it is the gall bladder and not the appendix." We did not pay much attention to that at the time.

Upon opening the abdomen under novocain the small bowel tended to protrude and we could not make a satisfactory examination. We had to give her ether. That was unfortunate; but it was not possible to do anything without it. The intestines were found to be markedly distended. As we packed them away looking for the appendix we found a quantity of fibrin on the small bowel. The fat of the appendix contained fibrin, but the appendix itself was perfectly normal. As we pushed the bowels away from the appendix we found five or six loops of the bowel covered with fibrin all of which came down to one central area. It was at this point that we found the gall stone in the bowel. The bowel was opened, the gall stone taken out, the bowel sutured, a tube put in the ileum a few inches above the operative wound and the wound closed without drainage.

As we look back on this case we feel that we did not pay enough attention to the original symptoms at the onset. That is, she had epigastric pain going on for several days; then something else happened and she seemed to have signs of an obstruction. We were perhaps a little misled by the localized tenderness, which was due to the inflammatory mass around the bowel with a stone in it; but as we look back we see that we might have been able to make a more correct diagnosis. It would not have made any difference in the end; but a diagnosis of a primary acute gall bladder condition with sec-

ondary obstruction from a gall stone could have been made.

DR. ARTHUR W. ALLEN: I did not see this patient; but several times we have seen intestinal obstruction from a gall stone that has ulcerated through into the intestinal tract. Usually when we look back into the history we get some suspicion of previous gall bladder symptoms and fully resolve that the next time we see a patient with this syndrome we will make the diagnosis; usually however the condition is overshadowed by some localized tenderness, as in Dr. Daland's case. I think that the diagnosis is rarely made prior to operation. Usually the patients are in such a serious state from their pathology that they offer a very difficult surgical problem. The mortality is pretty high in this group of patients.

It is always wise to drain the bowel above the obstruction, because the lumen is apt to be occluded by edema in the intestinal wall; but sometimes this drainage is so high that the patient will starve until you can reoperate and close the fistula.

CLINICAL DIAGNOSIS (FROM HOSPITAL RECORD)

Acute intestinal obstruction from gall stone.

ANATOMIC DIAGNOSES

Spontaneous cholecystoduodenostomy.
Operative wound, enterostomy.
Localized peritonitis.
Early bronchopneumonia.
Cardiac hypertrophy and dilatation.
Diverticula of the duodenum and colon.
Marked arteriosclerosis, aortic, coronary and renal.
Slight jaundice.
Leiomyomata of the uterus.
Obesity.

PATHOLOGIC DISCUSSION

DR. TRACY B. MALLORY: Dr. Allen's description fits fairly closely our findings. Dr. Daland had opened the bowel above the point of the inflammatory process and had done an enterostomy there. That point we measured as only 50 centimeters below the duodenum, so that it was a pretty high enterostomy. If she had lived past the first acute symptoms she might have had difficulty from that later. Of course that was not a matter of choice. He had to make the enterostomy where he could.

A portion of the intestine which he had noticed to be covered with fibrin and to show evidence of inflammation still showed a little fibrin on the surface, but on the whole the process had cleared up pretty well. The bowel appeared to be rather definitely kinked and possibly there was some degree of obstruction there. There was no generalized peritonitis.

The lungs showed a very slight trace of bronchopneumonia and the heart showed a very marked hypertrophy, obviously of hypertensive origin.

The one other finding was the one which we can always safely predict in a case of this sort. When you have a large enough gall stone passing into the intestinal tract to produce obstruction you can be practically certain that it has not reached the duodenum through the common bile duct and the papilla, but that a fistula must have developed between the gall bladder and the duodenum. About five centimeters below the pylorus we found a large opening between the duodenum and the gall bladder. In addition there were some diverticula in the duodenum, so that it is possible that this perforation may have occurred in the reverse fashion. Ordinarily when we have a gall stone and a fistula from the gall bladder into the duodenum we assume that cholecystitis with necrosis from gradual pressure of the stone has resulted in erosion of the two walls and the appearance of the fistula. Sometimes without a gall stone an ulcer or a diverticulum in the duodenum may ulcerate into the gall bladder. In this case there is the possibility that that may have happened.

There was a very large number of diverticula throughout the intestinal tract, in the large intestine as well as in the duodenum.

There is no evidence of any liver disease. That is, there had not been any obstruction in the bile ducts in this case.

CASE 19092

RECURRENT POSTOPERATIVE JAUNDICE

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. WILLIAM H. SNYDER, JR.:* *First admission.* This is the case of a man of twenty-four who entered the hospital for the first time complaining of jaundice.

His symptoms began ten and a half months previous to entry and consisted in very severe attacks of pain in the right upper quadrant associated with some jaundice. He had had several attacks, the longest lasting eight hours, others lasting only twenty minutes. They had come at irregular intervals of from one to three weeks during the two and a half months previous to his operation, which was ten and a half months previous to his entry to this hospital. He was operated on in an outside hospital for acute cholecystitis. At operation the gall bladder was removed. Three stones were found in it. Following the operation he did well, his jaundice subsided, he seemed to be in

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good condition and was discharged after an uneventful convalescence, except that on discharge he still had a draining sinus in the right upper quadrant.

He went along satisfactorily for the next three months and then returned to that same hospital because the sinus had not closed. At that time they injected a barium paste, made an x-ray examination and said that the sinus ended in a blind pocket three inches deep in his abdomen.

He left the hospital and returned again because of jaundice. At that time they did an exploratory laparotomy, expecting to find some type of obstruction in the common duct, but there were so many adhesions and so much difficulty in finding the duct that they closed the wound, leaving in a drain.

When he entered this hospital he was in fair condition except for his jaundice. He had no pains. He had had one period of three days of chills and fever previous to entry.

Physical examination revealed a pretty normal looking man with fair weight and good general appearance. His skin itched. His sclerae and skin were yellow. His van den Bergh was 30 milligrams and his icteric index was high.

A diagnosis of stricture of the common duct was made. Dr. Leland operated on him, finding at that time the common duct, which seemed at its proximal end to be constricted, thickened and hardened. It was opened and sounds were passed into the duodenum and upward to the liver. The sound they were able to pass into the proximal end was a very small one and was passed with great difficulty. The two ends of the duct were then united and a drain was placed in the wound.

He was in our hospital five weeks. For the first twelve days there was drainage of a great deal of bile, about 500 cubic centimeters daily. The amount became gradually reduced so that he finally drained little or no bile. His stools began to show color and his urine showed less color than previously. His van den Bergh dropped from 30 milligrams at entry to 4 milligrams. His general condition at that time was good. His sinus had practically closed at the time of discharge.

Second admission. He reëntered two months later. At this time he was much more jaundiced than at discharge, felt weak and tired and had lost considerable weight. Dr. Miller saw him and felt that the only thing that could be done was another exploration with an attempt to free the common duct and to make a new passage through this probably constricted duct.

Exploratory laparotomy was performed and the same situation found as before except that at this operation the proximal end of his common duct was entirely obliterated so far as the operator could tell. There was nothing but a mass of adhesions extending from the liver down towards the ampulla of Vater. The lower end was found and freed. It extended about an inch above the ampulla. A tube was placed in this. The upper end could not be found because of adhesions. A drain was put in.

The patient drained a little bile-stained material for a few days and died on the fourth day after operation from what we believed was common duct obstruction and hepatic damage. The liver at the time of operation showed definite cirrhosis.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Obstructive jaundice.

ANATOMIC DIAGNOSES

(Cholelithiasis.)
Operative wound: cholecystectomy with drainage.
Stricture of the common bile duct, marked.
Obstructive jaundice.
Acute hepatitis with necrosis.
Obstructive cirrhosis of the liver.
Hematoma of the right upper quadrant.
Bronchopneumonia, right lower lobe.
Hydrothorax, slight.
Chronic fibrous pleuritis.
Arteriosclerosis, aortic, slight.

DR. TRACY B. MALLORY: We found a moderate amount, about 800 cubic centimeters, of bloody fluid in the peritoneal cavity, we thought not enough to be very significant as a cause of death, however.

The liver was very much enlarged, weighing over 2500 grams, distinctly firm, dark green in color, but on the diaphragmatic surface there were numerous irregular patches, yellow, opaque and rather obviously necrotic, with localized areas of necrosis in the main body of the liver. On cutting across the liver marked dilatation of all the bile ducts was found and these were filled with clear colorless white bile. We searched all the vessels very carefully for any gross areas of thrombosis, since these necrotic areas looked very much like infarction, but we were not able to find anything in the portal vein, the hepatic artery or the hepatic veins. The gall bladder, of course, had been removed. When we dissected down the bile ducts, which we did with considerable difficulty, we were able to identify the right and left hepatic ducts, which were considerably dilated, and about one centimeter of the common bile duct just beyond the junction. Then there was an area perhaps two centimeters long where the continuity of the common bile duct completely disappeared. We were unable to force even the smallest probe through it. Beyond this area of stricture we again found the common duct and identified six centimeters of it until it passed through the ampulla. Inflammatory postoper-

ative stricture of the common duct was obviously the main factor in producing death.

The liver lesions interested us a great deal. I will show you the microscopic sections, although we still feel somewhat unable to explain them. If one selects the less necrotic portions of the liver one finds a typical obstructive cirrhosis. Each lobule is outlined by a considerable zone of fibrous tissue, and in that fibrous border there is a moderate proliferation of the bile ducts. That is the usual type of cirrhosis that follows long standing biliary obstruction. Other areas, however, somewhat triangular in shape, a centimeter by a centimeter and a half in size, are completely necrotic except for a small area immediately about the portal radicles. In one place we found a small thrombus in a hepatic vein, and the majority of the hepatic veins show a definite endophlebitis. The intima was raised, with an accumulation of polynuclears between the endothelial cells and the underlying muscular tissue. The portal radicles and the hepatic arteries were entirely free from obstruction. So we have evidence of a slight amount of obstruction in the hepatic veins but none in the blood vessels leading to the lobules. It is a condition that I do not remember ever having seen before.

DR. DANIEL F. JONES: I should like to call attention to the fact that he had had jaundice for a long period with frequent attacks of pain. That usually means stone in the common duct. It can, however, mean a stricture which slows the flow of bile and shuts it off occasionally just as a stone would. Of course if one reasoned from that one would consider that this was a stricture which caused the frequent attacks, as no stone was reported as being found in the common duct. The usual course of events is however that after a cholecystectomy the common duct is found to be constricted, as in this case.

As to the condition of the liver, I have never seen a liver showing the condition of which you spoke, but I have seen a number of cases of hepatic cirrhosis following long continued jaundice. I find that they are often very dangerous to operate upon in the late stages on account of the very large dilated veins. I have had to stop in two cases because of the great amount of bleeding. I do not know anything about the condition of which you speak here, the necrotic areas.

DR. MALLORY: There are three theoretic possibilities of infarcts in the liver. We may have infarct secondary to portal thrombosis, secondary to occlusion of the hepatic artery and finally secondary to occlusion of the hepatic veins, venous infarction instead of arterial. Our demonstration of that is not very conclusive in this case. We found a few small thrombi in some but not in all of the hepatic veins. We have seen the two other types in this hospital within a year.

It would be very interesting in this case to know how long he had had the stricture. That is very difficult to decide from the story as we get it. Certainly the statement in the history that the fistula ended in a blind pocket can be discounted entirely. He would not have had a fistula if it had not communicated with the common duct.

DR. FULLER ALBRIGHT: What is the cause of constriction to begin with? Just a stone that has been passed?

DR. MALLORY: That is probably the commonest cause. Of course there are congenital strictures of the common duct that we see in infants. In those cases, if the obstruction is complete the patients live only a few days. If it is less complete they may live up to one or two years. They eventually die of very marked obstructive cirrhosis.

DR. D. F. JONES: Stricture of the common duct due to gall stones is really a very rare condition. The strictures come very largely after operation.

DR. MALLORY: Yes, I think we would agree on that.

DR. CHESTER M. JONES: How much jaundice did he have when he was discharged the first time?

DR. SNYDER: When he was first discharged he had a van den Bergh of four. He had a slight tint, but the jaundice had pretty well disappeared.

DR. C. M. JONES: It seems to me that this is the type of case in which very prolonged biliary drainage seems to offer the only hope of solving the problem. We have had several cases like it. If drainage is not profuse or long enough we are going to get intrahepatic infection or common duct obstruction as the end result. It would seem also to be worth while not only to hold the patients here for very prolonged periods of drainage but to try to get bile constituents into the system even though the jaundice is well under control. What one would hope to do would be to prove conclusively that there was a good flow of bile down the common duct, or if a fistula was established, that it was followed by intermittent drainage. I am wondering whether this patient was drained long enough when he left the hospital the first time. It seemed as if the patient was doing well when he left the hospital, and yet the fact was that he did not do well.

DR. BETH VINCENT: These traumatic strictures of the common duct certainly present very difficult surgical problems. The operator in such a case hopes to be able to restore the continuity of the common duct by direct suture or by some type of plastic operation. In some cases, owing to the destruction of the duct and the extent of the defect it is impossible to do this. As Dr. Jones has said, in such obstructed

cases it is necessary to find the proximal segment and insert a tube for drainage. It has been shown that we can thus form an external biliary fistula and later implant this fistulous tract into the duodenum or the stomach and have a fairly adequate artificial duct leading from the liver to the intestine. Dr. Hugh Williams was the first to perform an operation of this kind in this hospital. Some of these cases give very good results if the tract does not tend to contract after operation. In one case in which I did the operation, the patient after three or four years illustrates the partially successful result that may be obtained. The tract was implanted with difficulty, but eventually the bile passed satisfactorily from the liver to the duodenum. The patient was subject however to recurring attacks of infection and partial obstruction, with the result that when she entered the hospital the last time it was evident that she had an extreme grade of obstructive cirrhosis with splenomegaly, a result that is to be expected under these circumstances.

DR. MALLORY: One question that might be raised is whether that injection of barium paste had something to do with increasing the stricture. Barium I believe has been injected in some of these cases with the idea of provoking enough inflammatory response to close the fistula.

DR. C. M. JONES: One other thing Dr. D. F. Jones has already mentioned. As these patients do tend to bleed the prognosis is almost always bad in surgery. This is one of the worst types of liver cases we have.

CASE 19093

UPPER ABDOMINAL PAIN WITH SEVERE PROSTRATION AND PERSISTENT VOMITING

SURGICAL DEPARTMENT

PRESENTATION OF CASE

DR. A. GORDON GAULD:* This is the case of a thirty-eight year old woman who entered the Emergency Ward complaining of epigastric pain and vomiting of twelve hours' duration.

The story goes back about eleven years before entry, when she first had epigastric discomfort and belching after meals. That continued for three years, then disappeared spontaneously. Three months before entry, when she was apparently well and healthy, the same symptoms recurred. They did not incapacitate her until the morning of admission, when she awoke with intense discomfort in the epigastrium, nausea and vomiting. She took enormous doses of sodium bicarbonate without relief. The discomfort soon developed into a dull steady pain in the upper abdomen radiating to the back on both sides, more on the left, with tenderness and spasm in the epigastrium. Her doctor gave her one dose of morphia during the day and sent her into the Emergency Ward late in the afternoon.

When she came in she was obviously sick, lying on her back moaning with pain in the abdomen. She had been vomiting all day and was dehydrated. There was no jaundice. She had severe pain across the whole upper abdomen radiating to the back on both sides. There was pronounced tenderness and spasm in the epigastrium, more marked in the left upper quadrant. There was also localized tenderness in the left costovertebral angle.

At entry the temperature was normal, 98.6°, and the white cell count 40,000. The urine showed no sugar but did show a trace of albumin and many granular and cellular casts.

Operation was done the day of admission. She did not recover well from the operation, went downhill rapidly and died the following morning at about three o'clock.

CLINICAL DISCUSSION

DR. ERNEST M. DALAND: At operation numerous stones were found in the gall bladder. In the retroperitoneal spaces we saw a large amount of bloody fluid. There were five or six tiny spots of fat necrosis in the region of the common duct, each about the size of the head of a pin. No other fat necroses could be made out. A diagnosis of acute pancreatitis was made and the common duct opened and drained. One stone was removed. Another, apparently pushed downward, could not be grasped. That was all we intended to do. On palpating with the finger again another stone was found. We were not able to tell exactly where it was. It felt as if it were in the common duct. It was very hard to visualize the cystic duct, so that by the time we had actually localized that stone impacted in the lower and cystic ducts the gall bladder had been freed, so that it seemed wiser to remove it. The stone in the cystic duct could not be dislodged even after the gall bladder and cystic duct were taken out. It was absolutely fixed in the cystic duct. Taking out the gall bladder prolonged the operation a little, but it seemed at the time that it was quite necessary. The pancreas was palpated and felt soft and boggy, but it was not drained.

DR. ARTHUR W. ALLEN: It is always a difficult problem to know just how much one should do to a patient of this type. Certainly the biliary system should be drained and probably the pancreatic capsule should be drained as a matter of routine. These cases however represent a very serious group of surgical emergencies that carry a very high mortality regardless of what is done. Even if the pancreas

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is drained the patient may live for a long time, have most of his pancreas slough away, and finally die. The question is always whether the pancreatic capsule should be opened in these cases as a matter of routine or whether we should depend in some of the earlier cases on simple biliary drainage. There have been two more or less distinct schools in regard to that. Most people think that if the patient can stand it and if it can be done, drainage of the pancreas in addition to drainage of the biliary system probably offers the best chance of recovery. It is a very serious group of cases, particularly most of those that have come in here through the Emergency Ward. It is very difficult to visualize a procedure that can be carried out as a matter of routine that will make the mortality much under fifty per cent.

DR. TRACY B. MALLORY: Have you anything to add, Dr. McKittrick?

DR. LELAND S. MCKITTRICK: I should like to pass my privilege of discussion over to Dr. Jones, who has stimulated my keen interest in pancreatitis and has taught me all that I know about it.

DR. DANIEL F. JONES: I should like to call attention in the first place to the fact that gall stones rarely cause vomiting. Often a patient will tell you that he has to put his finger down his throat. When we get persistent vomiting such as occurred in this case we should think pretty carefully about something else than gall stones, and the first thing to think about is the pancreas. I have had many talks with medical men and they do not see it as I do, but I am quite convinced that gall stones do not usually cause persistent vomiting; that persistent vomiting is almost always due to something else than gall stones.

In the treatment of these cases we should be guided by the condition of the patient. There is a school that believes that it is a bad thing to drain the capsule in these cases of pancreatitis. The feeling is that all that is necessary is to drain the common duct. I have taken the opposite point of view because I have seen a good many of these patients, some of whom have not had the capsule of the pancreas drained. I think every one will admit that there is a tremendous shock in acute pancreatitis, and I have found that by draining the capsule we relieve the patient of shock in a very short time. I am therefore convinced that the proper thing to do is first to drain the pancreatic capsule and then to do what we can about drainage of the biliary system. If there are gall stones in the gall bladder and the patient is in first-rate condition the gall bladder may be taken out if you think it best. On the other hand, if you feel very strongly that drainage of the biliary system is the proper thing to do, it can be done very quickly and easily. Drainage of the common duct can be done. I think that is probably as simple a way as any. Some men do not like to go into the region of the common duct to drain it. If you do not like to do that you can do a cholecystostomy, which is much easier but does not relieve pressure in the biliary system so well as a hole into the common duct. I am quite convinced that you will have more patients recover if you drain the capsule than if you drain the common duct alone. That is something Dr. Archibald of Montreal would object to seriously. He has said that the proper thing to do is to drain the common duct and never mind the capsule of the pancreas. It is my experience that it is the other way around, that drainage of the capsule is the important thing to let the patient recover from the shock in pancreatitis, and as I believe in Archibald's work I always drain the biliary system in some way. I believe that the shock in this case was due to her pancreas rather than to the impacted stone in the cystic duct.

Was the gall bladder distended or shut off?

DR. DALAND: It was moderately distended.

DR. JONES: The pain which we get in cholecystitis is a perfectly steady pain and one which it may be difficult to distinguish from the pain of pancreatitis. With cholecystitis the patient would have tenderness over the gall bladder. But if she had tenderness extending from the gall bladder to the left we can make a diagnosis of pancreatitis in addition to the cholecystitis. In cholecystitis the tenderness is distinctly over the gall bladder and to the right. In pancreatitis we may have pain over the gall bladder but the tenderness will extend to the left and may even extend into the left flank, into the region of the kidney.

CLINICAL DIAGNOSES (FROM HOSPITAL RECORD)

Cholecystitis.
Cholelithiasis.
Acute pancreatitis.

ANATOMIC DIAGNOSES

Choledocholithiasis.
Acute hemorrhagic pancreatitis with fat necrosis.
Operative wound, cholecystectomy with drainage of the common bile duct.
Fatty vacuolization of the liver.
Acute nephrosis.
Leiomyoma of the uterus.
Hyperplasia of the endometrium.
Cervical erosion.

DR. TRACY B. MALLORY: I should rather like to emphasize exactly that same point Dr. Jones made, that pain in the left upper quadrant is always an unusual symptom, and one thing of which you must certainly think in regard to it is pancreatitis. I think that is particularly true when the pain is felt on the left both anteriorly and posteriorly. Sometimes pancreatic pain is

felt nowhere except over the left kidney. We had one case of carcinoma of the tail of the pancreas in which the only symptom was back pain for three years. Pancreatitis may be localized to the tail of the pancreas, and with necrosis and abscess formation the whole picture may be absolutely indistinguishable from perinephric abscess.

The sections of this case are interesting. There are three sections from the pancreas. The one from the head shows total necrosis of the tissue with no living cells left whatever. A section from the midportion of the pancreas shows still very marked necrosis, but an occasional island of not completely necrotic pancreatic cells still remains. Two-thirds of the tissue, however, is completely gone. The section from the tail shows a marked interstitial hemorrhage and necrosis and a moderate amount of necrosis of the acinar cells, but here there are a few more islands of apparently unchanged cells. So that the process extends the entire distance from the head to the tail, but gets progressively less and less marked as the tail is approached.

The other section is from the kidney. Grossly these kidneys were swollen, of extraordinary softness, and the cortex showed brilliant radial hemorrhages throughout. You can see the extent of the interstitial hemorrhage here. With a slightly higher power one can make out that all of the convoluted tubules without exception are totally necrotic. The nuclei are all gone in the epithelial cells, the cytoplasm is granular and swollen, the typical appearance of coagulation necrosis. So that we have an acute degenerative process in the renal tubules. That has been noticed from time to time in cases of acute pancreatitis. There have been several papers written on it. We have had about four out of some fifteen cases of pancreatitis which show fairly marked necrosis of the renal tubules. It seems fair to interpret such changes as evidence of a toxemia due either to the ferments in the pancreas itself or to some toxic product resulting from the reaction of the ferments on the surrounding tissues.

In this case we found the classical picture described by Opie in hemorrhagic pancreatitis. There was a gall stone undoubtedly just at the papilla, the one that Dr. Daland had pushed down through into the duodenum. We found it about one centimeter beyond the papilla in the duodenum. We found a second gall stone in a pocket just above the entrance of the duct of Wirsung. I do not think that had any influence in the case because it was completely pocketed off from the lumen. But that first stone had been obstructing the ampulla while the duct of Wirsung entered one centimeter above this, just the proper findings to explain a flow of bile into the pancreas. We find that in only about 15 to 20 per cent of our pancreatitis cases. Almost always there is gall bladder disease in any case of pancreatitis; but to be able to prove the presence of stone in the ampulla in cases where the duct of Wirsung enters the common bile duct is in our experience the exception rather than the rule.

One question that has come into my mind several times is whether in certain cases one might not consider drainage from behind either instead of or as well as drainage from the front. Dr. Allen had a remarkable case this summer in which two abscesses had formed and dissected the entire length of the posterior abdominal wall on each side of the vertebral column. We had one case two years ago in which the first evidence of pancreatitis was a swelling of the scrotum. Operation was done for strangulated hernia, and we found an acute pancreatitis that had dissected through the entire length of the retroperitoneal tissues and finally made its way to the surface in the scrotum. Such extensive retroperitoneal dissection is not a very rare condition in my experience at autopsy. I should think that perhaps in some of these cases which survive the initial period and run a chronic course six to ten weeks before they die, such dissecting abscesses might logically be suspected and possibly drainage from behind might do some good.

DR. JONES: I wonder if drainage of the capsule which is carried around to the posterior surface of the pancreas would not do in most cases. You have a very difficult area to drain anyway, what we call olive oil bottle drainage, with a large cavity below with wicks coming out a long distance through a comparatively small opening from the cavity to the surface. If you look over the records of this hospital you will find that the great majority of cases have a rise in temperature from the seventh to the twelfth days and from that time on run a temperature from one to four weeks, during which time the patient is usually quite ill.

These abscesses give another important reason for draining the capsule of the pancreas in that many of these cases go along without much temperature for a week or more and then develop an abscess. I am interested to know that abscesses have been found running along the whole length of the spinal column. I have never happened to see one. I know that they are posterior to the pancreas very often and that they are often in the left flank where they are almost impossible to drain anteriorly. We occasionally have to go in posteriorly in the region of the kidney.

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HYPERSENSITIVE REACTIONS FOLLOWING THE USE OF SCARLET FEVER ANTITOXIN

IN a letter published in the February second issue of the *Journal*, Dr. E. L. Perry of Middleboro deplores the hypersensitive reactions following the use of scarlet fever antitoxin in patients who "had been sensitized by toxin-antitoxin (horse-serum base)."

From his brief description of the three cases, it is apparent that all patients suffered from serum sickness which appeared a week following a prophylactic dose of antitoxin. This perfectly well-recognized phenomenon is to be expected following the parenteral injection of horse serum in appreciable amounts, regardless of the presence or absence, in the history, of previous injection of horse serum. At the time when the various therapeutic antitoxins usually consisted of plain horse serum and *before the days of widespread immunization with toxin-antitoxin,* such reactions occurred in the *majority* of cases. Serum sickness is much less common at present, due, principally, to the concentration and refinement of the sera, which result in the elimination of the majority of antigenic, but not therapeutic, horse serum proteins.

Individuals have undoubtedly been sensitized to horse serum by the injection of toxin-antitoxin, but such sensitization, on subsequent reinjection of horse serum, seldom leads to any reaction other than an accelerated or aggravated serum sickness. The rare cases evidencing the immediate and serious symptoms of anaphylactic shock almost invariably follow the *first* injection of horse serum, and these reactions are due to an unexplained, natural hypersensitiveness to horse serum proteins of a degree far greater than that caused by any injections of toxin-antitoxin. Such degrees of sensitiveness can be determined by the dermic or ophthalmic tests which should precede all parenteral injections of serum. In the presence of a positive ophthalmic test, one must decide whether or not the benefits to be derived from the therapeutic serum outweigh the difficulties, inconveniences and risks of desensitization.

Although the immediate or accelerated reactions of the hypersensitive patient can usually be eliminated or prevented, there is no way, at present, of circumventing serum sickness in its most common form. It is undoubtedly a symptom complex resulting from an antigen-antibody reaction, but the antibody is usually derived from the bodily reaction to the recently injected, and still persisting, antigen, rather than to one injected at some previous date. As the methods of concentration and refinement improve, less and less of the antigenic components of horse serum are included in a given dose of antibody and, as a result, the incidence of serum sickness recedes. In the future, someone may discover a way to synthesize non-protein antibodies or to separate them completely from serum proteins—until then, serum sickness will persist. Serum sickness, fortunately, is not a fatal disease, in spite of its unpleasant and uncomfortable symptoms.

A RECENT VIEW OF HEREDITY*

IN the realm of science, there is no more fascinating subject than that of heredity, with its attendant problems of evolution. The inheritance of certain family characteristics through generation after generation excites our interest, while we are confounded by the thought that the qualities which appear in the adult individual are carried by the microscopic, single cells of the spermatozoon and the ovum. Of particular interest to physicians are those diseases, such as hemophilia, which are trans-

*The Mechanism of Creative Evolution. By C. C. Hurst. Published by The Macmillan Company, New York, and by The University Press, Cambridge, England. With a Frontispiece and 199 Figures. 365 Pages.

mitted by inheritance and appear only in those offspring belonging to one sex.

Within the past three decades great progress has been made in the study of heredity, and while as yet only a slight rift has been made in the darkness which has enveloped this problem, the foundations for further progress seem to have been securely laid.

This whole subject is admirably set forth by C. C. Hurst in his book entitled "The Mechanism of Creative Evolution." Illustrating his points by experiments made by various investigators with plants, insects, and animals, Hurst builds up a well-substantiated thesis which explains many of the problems connected with evolution.

He first establishes the fact that the chromosome is the important factor in heredity, and describes clearly the mechanism by which the chromosomes of the male and female cells unite to form the new individual. Considerable space is devoted to the various possibilities which attend this phenomenon. He shows how each species has a basic number of chromosomes, and how, under certain conditions affecting the division of the chromosomes, the number of chromosomes in the offspring may be increased in multiples of the original number, thus producing variations from the original stock. Other changes, involving new arrangements of the chromosome material, give rise to mutations and transmutations; all of these occur in nature, but may be produced 150,000 times more often by subjecting the parents to radiation by x-ray.

Hurst then proceeds to show how investigators have discovered that each chromosome consists of a large number of genes arranged somewhat like beads on a string, and that these genes are the carriers of inherited characteristics. These investigations have been based largely upon circumstantial evidence, for the gene is ultramicroscopic, about the size of the filterable viruses and the bacteriophage. In fact, Müller has expressed the belief that the bacteriophage may be a simple gene.

By tracing the backward track of evolution, Hurst comes to the conclusion that since "the gene is the unit and basis of living characters, it is reasonable to infer that life first arose in the form of primitive genes and progenes, most probably of the nature of autocatalytic molecules arising from those half-alive self-producing chemical ferments which seem to follow the formations of certain configurations of carbon and other atoms of matter".

Physicians will be interested in the studies on the transmission of hemophilia and color-blindness, and the few observations reported on the method of cell division in cancer cells. Of these last, Hurst says, "They go on dividing in any haphazard way, the chromosomes going into unequal groups, splitting and fragmenting or getting lost altogether so that there is no differentiation of the growing mass, no organization and no control——." It is not at all unlikely that through the researches of our sister science, biology, will be discovered the true nature of our great problem.

In his summing up of the facts of heredity, so far as we know them, Hurst expresses his belief that in the future evolution will be much more rapid than in the past. Until recent years it has been dependent upon the forces of nature aided by natural selection, and the mills of the gods grind slowly. But in the future man, aided by the new knowledge of the mechanism of inheritance and by means of artificial selection and by such agents as the x-ray and the ultraviolet ray, can produce vastly more mutants than have been produced heretofore; by selecting those best adapted for his uses, he can breed plants and animals superior to those which he now has. He can also breed out of the human race certain qualities or inherited weaknesses which now exist.

In forecasting the future of the human race, Hurst expresses some very interesting conclusions. Arguing from what has gone before in evolution, he concludes that mind will develop as matter loses in importance until a race is produced which may possess intellectual qualities now inconceivable to us. "It may be", he says, "that the discovery in our time of scientific indeterminacy and relativity foreshadows the coming of the next great step in the creative evolution of mind, far surpassing and transcending the present conceptual and deterministic mind of man."

"The Mechanism of Creative Evolution" is a fascinating book, full of suggestion for everyone who is interested in life on this planet. Modern genetics support fully the conclusions of Darwin and the later researches of Mendel, and in addition they give a scientific explanation for the theories of these pioneers. Whether the human race will proceed along the lines indicated by Hurst is a matter of conjecture. It would be interesting to see this world of ours a million years from now.

THE BILLS FOR AND AGAINST VACCINATION

THE hearing on the bills respecting vaccination is scheduled for March seventh. The bill S. 162 which has been drafted and sponsored by Dr. S. B. Woodward for several consecutive years providing for compulsory vaccination for private as well as public school pupils will this year be cared for especially by the State Department of Public Health. Dr. Woodward will also appear and argue for its passage. The counterefforts will appear in S. 783 which requires that no person shall be obliged to submit to vaccination unless the physician perform-

ing the vaccination shall supply the person with a statement guaranteeing the purity of the virus and further that injury caused by vaccination shall impose a liability on the physician unless the consent of the patient, if an adult, or the guardian or parent of a child shall have been previously given.

Senate 212 provides that no person shall be required to submit to any form of vaccination or inoculation as a condition precedent to admission to any school, institution of learning or public institution, nor to the exercise of any right, performance of any duty, or enjoyment of any privilege.

Again the issues are clearly joined, the public health authorities and many physicians striving for the prevention of smallpox and the antivaccinationists continuing their opposition. One side ardently is engaged in a contest for the prevention of disease and the opposition definitely skeptical of the value of protective measures against smallpox. Added to the latter group are some who have a violent antipathy to the invasion of control over one's person. This last conception of personal liberty is not logical, since no one may rightfully be a menace to his neighbor. With that spirit of service to humanity which is the heritage of the medical profession, this contest, unpleasant as it is, must go on in justice to those who are unable to protect themselves against this danger.

THIS WEEK'S ISSUE

CONTAINS articles by the following named authors:

STIVERS, GEORGE L. M.D. Long Island College Hospital 1899. Medical Director, Belmont Hospital, Worcester, Mass. His subject is "Closing of Tuberculous Lung Cavities by Intrapleural Pneumolysis." Page 469. Address: Belmont Hospital, Worcester, Mass.

MILLER, RICHARD H. A.B., M.D. Harvard University Medical School 1910. F.A.C.S. Associate Surgeon, Massachusetts General Hospital. Assistant Professor of Surgery, Harvard Medical School. His subject is "Lingual Goitre." Page 480. Address: 264 Beacon Street, Boston.

DAVIDSON, PERCY B.* A.B., M.D. Johns Hopkins University School of Medicine 1920. Formerly Assistant Professor of Medicine, Tufts College Medical School. Associated with him is

FREEDMAN, LOUIS M. A.B., M.D. Harvard University Medical School 1904. F.A.C.S. Visiting Laryngologist, Beth Israel Hospital. Visiting Surgeon for Diseases of Ear, Nose and Throat, Boston City Hospital. Address: 475 Commonwealth Avenue, Boston. Their subject is "Asymptomatic Permanent Collapse of a Pulmonary Lobe with Residual Infection." Page 485.

*Deceased. Formerly at 479 Beacon Street, Boston.

BECKMAN, HARRY. M.D. University of Louisville 1921. Professor of Pharmacology, School of Medicine, Marquette University. His subject is "The Present Status of Bismarsen in the Treatment of Syphilis." Page 487. Address: Marquette Medical School, Milwaukee, Wisconsin.

MILLER, JAMES RAGLAN. A.B., M.D. Johns Hopkins University School of Medicine 1911. F.A.C.S. Assistant Gynecologist and Obstetrician, Hartford Hospital. Gynecologist, Hartford Municipal Hospital, Hartford, Connecticut. His subject is "Do Official Death Rates for Diabetes, Cancer and the Puerperal State Accurately Reflect Present Conditions?" Page 490. Address: 179 Allyn Street, Hartford, Connecticut.

STILES, PERCY G. Ph.D. Assistant Professor of Physiology, Harvard University. Assistant Editor, Biological Abstracts. His subject is "Recent Progress in Physiology." Page 492. Address: Harvard Medical School, Boston.

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THIRD MEETING OF THE BOSTON MEDICAL HISTORY CLUB. JANUARY 16, 1933

THE subject of the evening's discussion was the Edwin Smith Papyrus with a general consideration of the sources of information which are available bearing on the state of medicine as a profession in Egypt in the earliest recorded periods. Supplementing the two communications dealing with this phase of the subject, Mr. Dows Dunham, the Assistant Curator of the Department of Fine Arts at the Boston Museum of Fine Arts, spoke on Egyptian Civilization during the period of the Kings and the building of the Pyramids.

Dr. Henry R. Viets drew attention to the fact that only within the period of the last forty or fifty years have we come to know anything of importance in regard to Egyptian medicine. This knowledge is obtained by the examination of six or seven papyri; only two of them, however, known as the Ebers and the Edwin Smith, are of particular interest. These were discovered in 1865 and 1872, respectively, but their translation was not undertaken until some years later. The Edwin Smith papyrus is by far the more important of the two and we now have an excellent translation, the results of eleven years' labor by Professor Breasted, published by the University of Chicago Press.

The Ebers papyrus is, to a large extent, a series of prescriptions which had been found

useful to Egyptian practitioners. Indeed, many of them have on their margins the endorsement of those who had employed them. These prescriptions were doubtless of a date far earlier than the papyrus itself, for they had been recopied many times and probably go back to a period of from 2000 to 2500 B.C. The later additions show the deteriorating effect of the time, for Egyptian medicine was at its height at the time of the IIIrd Dynasty and fell off toward the period of the New Kingdom; in other words, from the time of Imhotep, about 3,000 B.C., medicine began to decline, reaching its worst period about 600 B.C., only to be revived a couple of hundred years later by Hippocrates. Imhotep, who, in addition to being a physician, was also an architect, a law-giver and a ruler, was, apparently, to Egyptian medicine what Hippocrates was to Greek medicine, nearly 3,000 years later. He was deified by the Egyptians and furnished the pattern out of which the Greeks, having allotted medicine to Apollo's care, deified Aesculapius as his representative.

The Edwin Smith papyrus, which is a surgical treatise and therefore quite different from the Ebers papyrus, consists of an unusual series of cases, arranged in anatomical order and indicates that for the first time we see here an attempt to systematize medicine in an available form based on the actual experience of the author. This papyrus has served to renew our interest in Egyptian medicine, as well as to revolutionize many of our ideas in regard to the practice of medicine 4,000 years ago.

Dr. Hunter, who followed Dr. Viets, threw on the screen hieroglyphic pictures of portions of the Edwin Smith papyrus and the translation. To those acquainted with the appearance of Arabic in its printed form the characters in the translation have a striking resemblance. He then pointed out the form in which all the cases recorded in the papyrus were expressed. The author divided them, so far as treatment was concerned, into three classes: (1) "those that he would treat"; (2) "those with which he would contend" and (3) "those that he would not treat". Though there is nothing to indicate who the author of this treatise may have been, there would appear to be no reason why it might not have been the work of Imhotep himself. It was obviously transcribed by an amanuensis who was more or less careless and unable to find expressions to convey the author's ideas, for in some instances the language had no word to indicate the meaning; for example there was no word for brain and in discussing head injuries, which were first to be dealt with, he had frequent occasion to use the equivalent for the word brain. There were many "glosses" or comments, after each recorded case. These were interpretations of the meaning of the text provided by the author or subsequent commentators, for it is certain that the manuscript was transcribed long after the original was written. Dr. Hunter then selected cases at random, illustrating first a series of head injuries of varying degrees of severity and then passing on to the next series which were spinal injuries. One striking case was that of a high cervical fracture most carefully described; an exact duplicate of the young army football player who sustained an identical injury at New Haven in a football game two or three years ago. Five thousand years had provided no new methods of recording essential clinical phenomena and Imhotep, if he was the surgeon-author, arrived at precisely the same conclusion as to treatment that was reached by the surgeons of today in the case of the army football star. The papyrus ends abruptly in the midst of the record of a spinal case and so ends our knowledge of the progress that surgery had achieved among the Egyptians in or about 2000 B.C.

Mr. Dunham outlined the form of government under which Egypt was ruled in the time of the Kings. At the head was the king, an absolute monarch, possessing the power to do as he chose with his people. Under him was a vizier, or prime minister, who carried out the king's edicts. The work of the Government was allotted to certain departments the most important of which was that of the treasury. As there was no currency, as such, the treasury was a series of immense storehouses into which there was a steady flow of merchandise and food products (grain, etc.) which were being paid as taxes and were going out in payment of the costs of government. The recording of these exchanges necessitated an immense force of clerks. There was a department of taxation; another, in charge of public works, etc.; still another that recorded boundaries; all with many employees. In the construction of the Pyramids, for example, it is probable that as many as 100,000 men were employed. As they had only the lever and the wedge, knowing nothing of the pulley, it can readily be understood that an abundance of man-power was a necessity, for in the Pyramids, the stones in the lower tiers weighed several tons apiece and in the higher tiers even, two or three tons. Most of these stones were quarried near at hand, though some came from the other side of the river. Nearly all that were used in the interior finish of the burial chambers, came from 600 miles up the Nile and must have been conveyed by rafts. The burial customs of these people indicate a belief in a future life, for the tombs of the Kings were provided with all things that a king might need in the kind of life to which he had been accustomed. In their social relations they were a practical people. So far as their knowledge and experience went, the conduct of their affairs was reasonable and rational. It was only when they got over their depth that they resorted to mysticism and chicanery. As this was

true in respect to the normal and everyday affairs of existence, it was but natural that their ideas of health and the treatment of disease should have been looked at from the same angle.

MISCELLANY

A RADIO MESSAGE PREPARED AND SPONSORED BY THE COMMITTEE ON PUBLIC EDUCATION OF THE MASSACHUSETTS MEDICAL SOCIETY FOR THE DEPARTMENT OF PUBLIC HEALTH

What the State Is Doing for Crippled Children*

BY ROBERT BAYLEY OSGOOD, M.D.

In times of depression, men and women who have studied the older civilizations sometimes question whether we have really advanced since the days of the Greeks and Romans. In one respect at least we have surely advanced. We have become kinder to crippled children. Not many centuries ago a cripple was looked upon as a curse of God and was supposed to have a crooked mind as well as a crooked body. These unfortunate children were often hidden by their parents and sometimes killed in order to prevent the sufferings of their own minds and bodies and the shame of their families. Others became the sport of kings and a company of wretches existed who actually made children cripples for this purpose and sold them. Those cruel days have gone, but until very recently and in many American communities still, crippled children are neglected and suffer for this neglect. The states suffer with them, for they must be supported. This is a wasteful as well as an inhuman neglect, for most of these children, if cared for early, may be relieved of a large part of their disability and converted into wage-earning citizens. Accidents and injuries before or after birth cause a comparatively small number of crippled children. Diseases make most of the cripples and we have learned how to prevent the crippling effect of many of these diseases. Sir Robert Jones, the great British orthopedic surgeon, has said that generally cripples are made, not born.

There are many kinds of physical and mental handicaps which *cripple* children, such as blindness, deafness and backwardness, but I have been asked to talk to you this afternoon only about that large group whose future capacity for self-support is threatened by disease or defect of the bones, joints or muscles. These children are sometimes called orthopedic cripples because orthopedic surgeons attempt to restore or improve the function of the bones and joints and muscles which are not normal and to prevent the diseases which damage them.

A surgeon of Boston, John Ball Brown, was the first doctor in America to establish a hospital for the treatment of these serious bone and joint and muscle handicaps, in 1839, and his son, Buckminster Brown, was the first American surgeon to limit all his practice to the treatment of these troubles. Stimulated by his enthusiasm, Miss Anne Robbins opened in 1861 at the House of the Good Samaritan, which was then located on McLean Street, the first charitable ward in this country for the treatment of crippled children. The citizens of Massachusetts have always been sensitive to the needs of crippled children and the Children's Hospital soon after it was established opened wards to these cases.

It early became evident to Dr. Edward H. Bradford that something else besides the relief of these children's physical handicaps was necessary if they were to become good citizens. They must be educated in reading, writing and arithmetic and must be taught trades and professions in which it would be possible for them to excel in spite of their physical defects. For this purpose he raised the money to establish in 1893 the Industrial School for Crippled and Deformed Children, which was the first of its kind in this country and is still doing an excellent piece of work at 241 St. Botolph Street, supported entirely by private charity. A bus transportation system brings these children from their homes to the school every morning. The school teaches them their lessons and trains them in printing, cane seating, carpentry, sewing, embroidery, cooking and domestic science, etc., and gives them a hearty luncheon. They are taken back to their homes late in the afternoon.

Other schools of this sort have been established throughout the United States. In Massachusetts there are several other privately financed schools for crippled children, such as the New England Peabody Home in Brookline, the Convalescent Home of the Boston Children's Hospital at Wellesley, the Sol-E-Mar School near New Bedford on the seashore at Dartmouth, the school at Pittsfield managed by the Berkshire County Society for Crippled and Deformed Children and the Shriners' Hospital in Springfield. In all these latter institutions, treatment as well as education is provided and the children have the benefit of nourishing food and take the sun and fresh air cures which are so important in making them strong and rosy cheeked. In five of the larger cities in Massachusetts,—Boston, Fall River, New Bedford, Worcester and Springfield —schools or classes for crippled children are maintained as a part of the regular public school system. Holyoke and Melrose were the first Massachusetts cities to employ a full-time teacher to give instruction in their homes to crippled children who could not attend school. Several other cities and towns have followed their lead.

In spite of all this splendid effort of private charities or city governments to relieve the burden of the cripple, the problem remains unsolved in many localities. These charities still need the most generous support of the citizens of Massachusetts, for their work does not in any way duplicate the work of the State.

Minnesota was the first state in our Union to at-

*Station WBZ, October 11, 1932, 4:15 P. M.

tempt to meet the situation of its dependent bone and joint and muscle cripples. In 1897, the Legislature of Minnesota appropriated sufficient money to build and maintain a State Hospital for the crippled at Phalen Park and this hospital school has been functioning effectively ever since. Massachusetts was not far behind, and in 1907 built the State Hospital School at Canton. The citizens of the state may well take pride in this institution which under the wise and kindly superintendence of Dr. John Fish has established such a reputation for administration and success in the rehabilitation of crippled children that its visitors' book bears the signatures of distinguished administrators and many eminent orthopedic surgeons from all over Europe and America. The school teachers who appear on its rolls play no greater part in the rehabilitation of these children than the butcher, the baker, the candlestick maker, the farmer, the housekeeper, the cook, the plumber, the musician, the printer and the other heads of departments of this little self-supporting, out-of-door city of 500 inhabitants. The children are apprenticed to these heads who are selected for their character as well as their skill, and the crippled children learn the trades suitable to their handicap. When after several years of book learning and trade learning, these grown-up boys and girls go back to their homes, they need ask no favors and may join the regular army of wage-earners. To see these independent citizens when they come back to visit their old school on alumni day is an inspiring sight.

In 1910, the Massachusetts Health Commission established a state hospital at Lakeville for the care of children and adults suffering from tuberculosis of the bones and joints. Here the children may have the benison of country sun and country fresh air and a large group of crippled children are thus being restored to health. Until this hospital was established, an entirely insufficient number of beds was available in other private and state institutions for the long stay which these patients require if they are to overcome the disease. This hospital is playing an important part in the effort to give crippled children their proper place in the sun.

In 1930, the Legislature of the State of Massachusetts passed a very important amendment to Chapter 7, Section 46a, of the General Laws. This amendment requires the school committee of every town to ascertain every year under regulations prescribed by the Department and Commissioner of Public Welfare the number of children of school age who are crippled. The act also requires that in any town where five or more children are found who are so crippled that their attendance at a public school is not feasible, the school committee shall employ a part or full-time teacher who shall give instruction to these children in their own homes or at some other suitable place. A yearly census of crippled children is thus assured and provision is also made for their education. The State Department of Public Welfare and the Department of Education are closely coöperating to carry out this law. Thirty towns and cities have already complied with it and from surveys made under the direction of school physicians and nurses, by means of forms circulated among practising physicians and social agencies, a fairly accurate idea has already been obtained as to the number of cripples within the state and of the size of the problem which they present. There are nearly 3,600 cripples now in the public schools of the state and nearly three-quarters of them are doing well. There are about 1,800 crippled children living at home, but two-thirds of these are already receiving schooling and only about 250 of the remainder are of sufficient mentality to benefit from schooling. Thus the problem of education of the crippled children in Massachusetts does not seem to be very difficult of solution.

Its solution may be said to be in sight if there is general compliance by the school committees of our townships with the new law. This law will make it possible for the State to develop a broader social service for crippled children. Parents will more generally realize what can be done for their children's betterment and the public will become more aware of its responsibilities. Massachusetts citizens must not become complacent or lie down on their oars, but they have reason to be grateful to the former State governments which have planned so wisely and accomplished so much. The prayer of the crippled child for his place in the sun is being heard in Massachusetts.

PROTECTION FOR YOUNG WORKERS

Urgent need for more adequate protection of young workers against industrial accidents and occupational diseases is stressed in the report of an advisory committee of experts appointed last year by the Children's Bureau of the U. S. Department of Labor to study the employment of minors in hazardous occupations, and formulate standards for their protection.

The report, just made public through the Children's Bureau, embodies the unanimous conclusions of the 19 members of the committee, composed of specialists in labor law administration, safety engineers, and industrial hygienists. The appointment of this advisory committee was made by the Children's Bureau upon the recommendation of the Committee on Vocational Guidance and Child Labor of the White House Conference on Child Health and Protection.

The committee gave consideration only to occupations involving accident or health hazards, and the report makes specific recommendations for the prohibition of employment of minors under 18 years of age in 28 general occupations involving mechanical hazards, in 34 occupations involving specified machines and in a number of occupations involving exposure to specified injurious substances.

In its general recommendations, the committee strongly endorses the recommendations of the 1930 White House Conference on Child Health and Protection that State labor boards be empowered to determine what are dangerous and injurious occupations and prohibit minors' employment therein; that minors be given full protection through adequate child-labor law administration and especially the establishment of adequate inspection forces; and that employers be required to pay double compensation to minors injured while illegally employed.

The committee emphasizes the necessity of proper safeguarding of machines and apparatus used in educational, charitable, and corrective institutions, public and private, and recommends that authorization be given to the appropriate State agency to compel the safeguarding of all machines and apparatus and of the use of chemicals in such institutions, and provide inspection to see that such safeguards are adequately maintained.

The committee recommends that further information on vehicular accidents to minors in industry, particularly for accidents to minors in messenger and delivery service, be obtained by the Children's Bureau and that the bureau coöperate with the States in the collection and tabulation of uniform statistics on industrial injuries to minors. The bureau is also called upon to appoint appropriate subcommittees to draw up definite standards for the guidance of enforcing authorities in the various States and for the education of employers in what constitutes safe conditions of employment for minors.

"Child-labor legislation has been slow to take into account the peculiar susceptibility of the young worker to accident and occupational disease," the report states. "On the whole, the mass of this legislation has been formulated without sufficiently detailed knowledge of modern industrial conditions. . . . One of the most obvious weaknesses is the failure to regulate adequately the employment of minors 16 and 17 years of age although high accident rates indicate that this group of minors is in great need of protection."

In making public the committee's report, Grace Abbott, chief of the Children's Bureau said: "Because of the rapid changes which take place in industrial processes, requiring new substances, machines, and new methods of operation, and because of the discovery of the effects of old processes and old methods, these recommendations may require revision from time to time. The Children's Bureau plans to ask the help of the committee in making such revisions in the future."

Research is continuing along several lines, including hazards involved in messenger service and in the operation of dangerous power-driven farm machinery.— *U. S. Department of Labor, Children's Bureau, Washington.*

AN IMPORTANT COMMUNITY PROGRAM

BY MARGARET FLYNN*

In a recent news release, Mr. Newton D. Baker, Chairman of the Welfare and Relief Mobilization of 1932, pointed out certain after-effects of the depression to be guarded against.

"Today, as in war times," said Mr. Baker, "we see all about us, not only young men and young women, but those of mature years suddenly uprooted from homes and occupations, and exposed to the potential evils of disease and vice against which we struggled so heroically and intelligently in the Great War. The danger is that we will fail to see this analogy; that the same human values for the preservation of which we spent millions of dollars then, are now in jeopardy; that unless we act now, the venereal diseases against which we have made notable headway since 1917 will spread extensively, with great cost to men, women, and children in communities throughout the country.

"Quite as important as the medical problem, though less immediately obvious, is the aggravation, brought about by the depression, of other social hygiene conditions in community and family life. The general atmosphere of unrest and uncertainty threatens the stability of ordinarily normal persons. Men who are heads of households must leave home, and women must leave their families, in order to gain employment, thus increasing the danger of broken homes and neglected children. Unemployment is sometimes a factor in reducing the resistance of young women and causing them more easily to become the victims of those who live by exploiting women. Without the safeguard of work, the danger of delinquency is greater for the easily influenced boy and girl."

The Social Hygiene Division of the State Board of Health is offering every possible assistance to local agencies to combat these hidden dangers to health and morals. The work of these agencies is just as essential now as it was fifteen years ago. Provision should be made for parent-education and recreation, as well as for continued medical and protective activities, in every community health program.

*Bulletin of the State Board of Health of Kentucky.

NUTRITIVE VALUE OF CRANBERRIES†

By Carl R. Fellers, Ph.D., F.A.P.H.A.

Among the fruits, the cranberry is unique in several ways. It is among the last of the fruits to mature before winter, and because of its good keeping qualities is the only fresh berry available during the autumn and early winter. Normally the cranberry is consumed only after cooking. Cooked cranberries form a firm sauce or jelly

†Excerpts from an address read before the Food and Nutrition Section of the American Public Health Association at the Sixty-First Annual Meeting in Washington, D. C., October 24, 1932.

with 40-45 per cent sugar, whereas other fruits require from 65-70 per cent.

PROXIMATE ANALYSIS

The cranberry contains about 11.5 per cent dry matter.

Food Constituents of Cranberries — The sugars are relatively low, the acids high. According to Nelson[1] about 88 per cent of the fixed acids are citric, the rest malic. Our data show a benzoic acid content of 0.035 to 0.095 per cent in 10 varieties—amounts that exert considerable preserving action on both the fresh fruit and manufactured products. Experience has shown that after filling the cans or jars with hot cranberry sauce, no further heat treatment is necessary.

Quinic acid, or a substance yielding quinic acid, is present to the extent of 0.6-0.9 per cent. This value was obtained indirectly by determining the total hippuric acid in the urine of young men on diets containing known amounts of cranberries. The benzoic acid in the berries was insufficient to account for the amount of hippuric obtained, hence the difference was assumed to be due to quinic acid. Recently Morse[2] has checked these results by more direct analytical methods. Great controversy has raged over the alleged harmful effects of small amounts of benzoates upon human health. In view of the simple method of elimination of benzoic acid from the body—conjugation with glycine to form hippuric acid, which is voided in the urine—the preponderance of scientific opinion, and our findings on young men fed up to 300 Gm. of cranberries daily, support the view of the relative harmlessness of cranberries so far as their benzoic acid content goes. However, the recently discovered quinic acid is present in much larger quantities and, as Quick[3] has proved, is transformed first to benzoic and finally to hippuric in a manner analogous to benzoic acid itself. The elimination of quinic acid from the body though slower is usually complete in 12 hours. Blatherwick[4] found that large doses of both prunes and cranberries increased the organic acids of the urine. Prunes produced twice as much hippuric acid as cranberries. The dose of cranberries fed was 300 Gm., equivalent to almost 2 lb. of cranberry sauce.

EFFECT OF CRANBERRIES ON HIPPURIC ACID IN THE URINE AND THE BLOOD PLASMA ALKALI RESERVE

Wt. of Cranberries Fed Grams	Equiv. Wt. of Cranberry Sauce Oz. Avoir.	No. of Subjects	Decrease pH Urine	Hippuric Acid Mg. in 100 cc. of Urine Increase Over Normal	Alkali Reserve cc. of CO_2 per 100 cc. Plasma Decrease from Normal
22.0	2.0	4	+.06	0.1	+0.9
32.7	3.0	2	.00	0.53	+0.8
54.0	5.0	2	.08	0.32	+3.5
100.0	9.2	2	.16	0.76	14.7
150.0	14.0	2	.21	1.68	23.0
200.0	18.6	2	.23	2.15	33.1
250.0	23.2	4	.35	2.48	40.8
300.0	27.5	2	.42	3.60	46.5

The hippuric acid in the urine is practically proportionate to the weight of cranberries eaten, though small doses affect the acidity very little. Similarly the pH of the urine was affected appreciably only after the administration of rather large quantities of cranberries.

The alkali reserve showed no decrease until more than 54 Gm. of cranberries, equivalent to 5 oz. of cranberry sauce, had been eaten. Thus, usual, or even liberal servings of this sauce, do not appreciably affect the body's alkali reserve. The buffer action of the blood probably accounts for this protective action. Very large doses do produce significant transitory decreases in the blood alkali reserve.

Apparently the citric and malic acids present in cranberries are fully oxidized.

Other Constituents—Pectin is present in considerable quantity and is the constituent responsible for the high jellying power of cranberry sauce. The fruit must be cooked with boiling water to extract the pectin. Unlike other fruits the pulp or juice forms a firm jelly at a sugar content of 40-45 per cent.

The wax is present largely on the skins and acts to protect the fruit from water, insects and fungi. The protein content is low, about 0.4. The fiber, consisting largely of skins and seeds, is not objectionable in whole fruit sauce, and aids in elimination. The cranberry itself is mildly laxative.

The ash content is relatively low, but its reaction is definitely alkaline, in several varieties averaging 2.2. In spite of this some writers have stated that "prunes, plums and cranberries" are exceptions to the fruits that leave alkaline residues after digestion.

The ash constituents are largely potassium, calcium and phosphorus. Morse[5], and McClendon[6] have determined the iodine content, which ranges from 26 to 138 parts per billion. This is relatively high for fruits and vegetables, and cranberries thus approach some marine foods in iodine content. The manganese content is likewise significantly high.

VITAMINS OF CRANBERRIES

The writer in collaboration with Isham has just completed a vitamin survey of cranberries. Only a summary of the results can be given here.

Using the Sherman, LaMer and Campbell[7] technic, we found the vitamin C content of fresh cranberries in 1930 and 1931 to be relatively high—

from 3 to 4 Gm. daily sufficing to maintain normal growth and afford full protection from scurvy in 300 Gm. guinea-pigs. There was no varietal difference. The fresh fruit when stored for 3 months at 40° F. showed very little loss of vitamin C. Freezing and subsequent storage at 0° F. for 9 months did not affect the vitamin C content. However, alternate freezing and thawing had a very destructive effect. Evaporated whole cranberries contained no measurable amount of vitamin C, but a quick-dried powder or film retained over 50 per cent of the original C content. Cranberry juice is becoming a popular beverage. The fresh juice is fully as potent as the fruit, but after extraction, bottling, and processing, little of the vitamin C is retained by the methods now in use.

Whole-fruit cranberry sauce as usually prepared contains approximately 80 per cent of the original vitamin C content, but strained sauce retains less than 10 per cent.

Vitamins B and D were absent or present in such small quantities as to be insignificant. Vitamin G was present in traces only. Vitamin A was present in small but measurable amount—1.2 units per Gm. This was sufficient to cure xerophthalmia in rats and produce normal growth.

SUMMARY

Aside from its esthetic values of eye and taste appeal, the cranberry is valuable in the diet chiefly for its high vitamin C, iodine, and energy values. The ash is slightly basic and contains significant amounts of potassium, phosphorus, manganese, and iron.

The benzoic acid content of fresh cranberries varies from 0.035 to 0.095 per cent and quinic acid from 0.6 to 0.9 per cent.

Moderate, or even generous servings of cranberry sauce do not lower the blood alkali reserve but very large quantities decrease it significantly.

The conjugation of benzoic and quinic acids in the body produce urinary acidities in proportion to the amounts of cranberry ingested, though servings of 5 oz. or less of cranberry sauce produce little change in either pH or hippuric acid values.

Fresh and frozen cranberries and whole-fruit jellied sauce are excellent sources of vitamin C and contain significant amounts of vitamin A as well. Vitamins B, D, and G are not present in significant amounts.

The cranberry possesses considerable merit as a food and when eaten in normal quantities its wider use in the diet can be recommended.

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7 Sherman, H. C., LaMer, V. K., and Campbell, H. L.: The quantitative determination of the antiscorbutic vitamin. J. Am. Chem. Soc., 44:165-172, 1922.

CORRESPONDENCE

CREDIT TO MR. E. L. JUDAH

Laboratory of Pathology
195 Pilgrim Road
Boston, Massachusetts

February 23, 1933.

To the Editor,
The *New England Journal of Medicine*,

Dr. Thomas Ordway has called my attention to an inaccuracy in my article "A Method of Mounting Gross Specimens" which appeared in the *New England Journal of Medicine*, February 9, 1933. Dr. Ordway tells me the credit given him is due to Mr. E. L. Judah, who taught the method of mounting the specimens in liquid in his course on technique given at McGill University. The method was introduced into the laboratory of the Albany Medical College by Mr. Charles Brown of the Division of Laboratories and Research of the New York State Department of Public Health.

Yours very truly,
SHIELDS WARREN.

RECENT DEATHS

SHIRLEY — ALLEN L. SHIRLEY, M.D., of East Bridgewater, died at his home February 20, 1933. He was born in Fryeburg, Maine, in 1865, and, after acquiring his early education at the Fryeburg Academy, entered the Bowdoin Medical School from which he graduated in 1890.

Dr. Shirley was never married and leaves no near relatives.

SOUTTER — ROBERT SOUTTER, A.B., M.D., died in Boston, February 21, 1933. Dr. Soutter was born in Kingston, New York, October 4, 1870, the son of Robert and Charlotte Lamar Soutter. He received his premedical education at Harvard University and acquired his M.D. degree from the Medical School of his Alma Mater in 1898. He subsequently served both as medical and surgical intern in the Children's and City Hospitals of Boston. His subsequent appointments included district physician of the Boston Dispensary, surgeon-in-chief to the House of the Good Samaritan, associate surgeon to the Peabody Home for Cripples, surgeon to the Children's Hospital, instructor in orthopedic surgery at the Harvard Medical School, surgeon-in-chief to the Massachusetts Hospital for Cripples and surgeon to the Long Island Hospital. His society memberships included the following: The Massachusetts Medical Society, Societe des Chirurgie, Paris, France; the American College of Surgeons, Societe Internationale de Chirurgie Orthopedic, Paris; the American Orthopedic Association; the American Medi-

cal Association; Boston Surgical Society; Boston Orthopedic Society; Eastern Interurban Orthopedic Society; Boston City Hospital Alumni Association and the Children's Hospital Alumni Association.

Dr. Soutter is survived by his widow, Mrs. Helen E. (Whiteside) Soutter and four children, Robert Soutter, Jr., Lamar Soutter, Anne Soutter and James T. Soutter.

DILLON—MICHAEL JOHN DILLON, JR., M.D., died at his home in Springfield, Mass., February 11, 1933.

Dr. Dillon was born in 1883 and graduated in medicine from the Baltimore Medical College in 1908 and soon after began practice in Springfield where he acquired an enviable reputation as one of the leading physicians in that city.

He was senior member of the Mercy Hospital Surgical Staff at the time of his death and had served as president of the Springfield Academy of Medicine, a member of the City Board of Health and in charge of the medical work of the Isolation Hospital.

He was prominent in civic affairs.

Dr. Dillon joined the Massachusetts Medical Society in 1910 and was a Fellow of the American Medical Association.

NOTICES

HARVARD UNIVERSITY

FREE PUBLIC LECTURES ON MEDICAL SUBJECTS

The Faculty of Medicine of Harvard University offers a course of free public lectures on medical subjects, to be given at the Medical School, Longwood Avenue, Boston, on Sunday afternoons. The lectures will begin at four o'clock and the doors will be closed at five minutes past the hour. No tickets are required.

SUNDAY AFTERNOONS AT FOUR O'CLOCK

March 5—Dr. E. L. Oliver: The Care of the Skin and Scalp.

March 12—Dr. Shields Warren: Cancer and Radiation Therapy.

March 19—Dr. Randall Clifford: The Tuberculosis Problem Today.

March 26—Dr. W. G. Smillie: A Discussion of the Common Cold.

RADIO HEALTH MESSAGES

MARCH, 1933

Sponsored by the Public Education Committee of the Massachusetts Medical Society and the Massachusetts Department of Public Health.

Courtesy WBZ. Tuesdays, 4:15 P.M.

March

7 Vacation Health
14 The Use and Abuse of Serums and Vaccines
21 Can We Prevent Diabetes?
28 Hobbies and Health

STATE HOUSE BROADCAST

Sponsored by the Massachusetts Department of Public Health.

Courtesy WEEI. Fridays, 12:45 P.M.

Health Subjects of Public Interest discussed by the Division Directors of the Department.

RADIO HEALTH FORUM

Queries from the public are answered under the sponsorship of the Department of Public Health.

Courtesy WEEI. Fridays, 4:50 P.M.

Questions on Health and Prevention of Disease may be sent to Radio Health Forum, State Department of Public Health, State House, Boston.

CLINICS IN MEDICINE AT PETER BENT BRIGHAM HOSPITAL

On Thursdays at 3:30 P.M. in the Amphitheatre of the Peter Bent Brigham Hospital Dr. Henry A. Christian, Hersey Professor of the Theory and Practice of Physic, Harvard, and Physician-in-Chief, Peter Bent Brigham Hospital, will give a series of clinics which members of the medical profession are cordially invited to attend. The next clinic will be given on March 9.

Physicians and medical students are also invited to attend ward rounds of the Medical Staff of the Peter Bent Brigham Hospital held from 10-12 o'clock on Saturdays, as well as a clinical-pathological demonstration immediately following these rounds.

A WARNING

Information has been furnished that a youth has solicited non-resident Fellowship dues to the Massachusetts Medical Society with the explanation that a commission would be paid the solicitor which would help him in securing a medical education. No such person is authorized to represent the Society. In this instance the solicitor retained the full amount collected.

REPORTS AND NOTICES OF MEETINGS

MASSACHUSETTS GENERAL HOSPITAL

STAFF MEETING

The regular meeting of the Staff of the Massachusetts General Hospital was held on January 12. Dr. J. C. Mixter presided.

The meeting was devoted to a discussion of the costs of medical care. Papers were read by Dr. Walter P. Bowers, who was a member of the Committee on Costs of Medical Care, and by Dr. John M. Birnie, former president of the Massachusetts Medical Society.

Dr. Bowers listed and interpreted the recommendations of the Committee. Half of the committee were physicians, the others, philanthropists and sociologists. The support of the work of the Committee was furnished by eight foundations. When

it was organized in 1927 a five-year fact-finding program, under the direction of a research staff, was outlined. During this time, twenty-six studies were prepared.

A preliminary report covered facts concerning the expenses of medical care. These salient facts have been recorded previously in this *Journal*, so they will not be repeated. It is important to note, however, that 52% of families with an income of less than $1200 paid nothing for medical care, while of the group with incomes of $1200 to $2000, only 23% paid for hospital care. Private budgets, especially in the lower wage earning groups, must therefore be reconstructed if there is to be any reserve for meeting the costs of illness.

Other reports cover the extent of illness, investment in hospitals, care for workers, incomes of physicians, distribution of drugs, and the ability of the public to pay for medical care.

The great value of the Committee's work, according to Dr. Bowers, rests in the accumulation of these data. The final report is the least valuable of the publications, for it contains only the deductions and conclusions.

Additional data of value are found in the study of 9000 families in widely separated states comprising over thirty-eight thousand individuals.

True economy must consider the most efficient prevention of disease, and the best treatment by practitioners. The great burden at present is due to expenditure of money in the wrong directions. This is important in this State because of the attempts of cultists to establish themselves and because of very many unwise expenditures. Another difficulty arises because many people fail to think of health and to provide for illness, even though the press and radio are emphasizing it.

It soon appeared that it would be impossible to obtain a unanimous report. Representation of the American Medical Association opposed the Committee, suspecting that an attempt to lower physicians' incomes was being made. This is far from true. It is unfortunate that the Minority Reports, which were included in the final report, were not more articulate and definite.

The recommendations of the majority were briefly discussed. The first advised medical care to be furnished by groups organized about a hospital. These groups should include physicians, dentists, nurses, pharmacists, technicians, and midwives for home and hospital care. The second recommended the extension of all public health agencies, raising the per capita payment from $1 to $3. In the third, it was advised that the costs of medical care be placed on a group payment basis through the use of taxation or of voluntary insurance. The majority do not believe compulsory insurance should be adopted until the voluntary method has been tried. No objection is raised to the extension of state care for chronic invalids.

Fourthly, the Committee recommends that agencies be formed to promote coördination of medical services. One great difficulty has been the individualistic character of medical practice. In the fifth and final recommendation, the importance of better education for all concerned in the health program is stressed.

The major Minority Report was signed by eight of the 24 physicians on the Committee. They endorse the strengthening of public health, approve coöperation, and say that better training of medical practitioners is necessary. They fear some evils, most of which, however, have been considered in the Majority Report. They contend that a medical hierarchy will be formed, that no individual could set up in practice in a new community, without approval of groups of physicians, that clinics would be formed in competition with each other, and that private group clinics are today only half-heartedly supported. To their final objection, that hospitals should not attempt to control practice in the surrounding communities, all agree.

Dr. Birnie presented his own reaction to the report of the Committee in substance as follows:

DR. JOHN M. BIRNIE: The final report of the Committee on the Costs of Medical Care has been published. It represents a vast amount of work and contains much valuable material. Every doctor should read it and will be well repaid for his effort. Unfortunately most of us have seen only the final recommendations of the Committee, as printed in the lay press. Without their accompanying explanations they seem, on first thoughts, rather disquieting and revolutionary. On careful examination we find that there is nothing to worry about. Of the five recommendations we can accept three without exceptions. They embody the ideals and objectives for which the medical profession has striven for years. One of the recommendations concerning insurance, we can accept with reservations. Only one recommendation is open to discussion and the Committee itself states that it is not a practical recommendation at present, so why worry?

DISCUSSION

DR. FREDERICK T. LORD: I welcome this opportunity to pay tribute to Dr. Bowers and the other members of the Committee for their remarkable report.

It is, I think, to be regarded as the most important fact-finding survey of medical facilities ever made. It indicates that for a large proportion of the population medical service is inadequate. The solution of the problem is difficult and will, doubtless, need readjustments, but it seems obvious that more rapid and satisfactory progress will be made if the initiative comes from within rather than from without the medical profession.

The amount of medical care, the Committee points out, depends on income levels and also varies with different localities being directly proportional to the size of the community. We are here concerned in the Eastern part of Massachusetts, a thickly settled region, with special prob-

lems and should, I think, follow the recommendation of the Committee to consider plans for the extension and improvement of medical service.

Extension of public health service is recommended by the Committee in order that it may be generally available through increased financial support and the establishment of full-time health officers. The majority and the minority report are in agreement with respect to the recommendations for strengthening the public health service and I need only discuss such matters from a local point of view.

First let me say that we are fortunate in this State in having a highly efficient State Department of Public Health under the Commissioner, Dr. George H. Bigelow. As instances of the progressive policy of this Department I may refer to the campaign for the early and adequate treatment of cancer and the establishment of the State Hospital at Pondville and seventeen State-aided cancer clinics and, also, to the pneumonia study and service. Specific serum therapy of lobar pneumonia is now available to one-half the population of the State, the expense being borne by a grant obtained by Dr. Bigelow from the Commonwealth Fund of New York. Such facilities are not available elsewhere in this or other communities. Both of these projects have the merit of improving facilities through coöperation of the medical profession with the Public Health Department.

A difficulty in carrying out Public Health projects is the lack of public support. Thus, for example, immunization against diphtheria not only saves lives but in the end money. The cost, borne by local communities, amounts to only fifty cents to one dollar per child and, yet, only one to twenty-five per cent of the children are protected. The discovery and treatment of tuberculosis in children may be regarded as one of the most important means of controlling the disease. About one-fifth of the school children in the State have been investigated in the course of the Ten-Year Program, now in its ninth year. Though the cost is borne by the taxpayer, parental consents were obtained in only about 50-60% in 1930-31 and 60-70% in 1931-32. Adequate attempts to control these diseases with us is less a matter of expense than the education of the public to accept available facilities.

The lack of adequate rural health service is due partly to financial reasons and partly to failure to appreciate its importance. There are two Model Health Units, with accessory benefits, in the State, one in Berkshire County, established in 1930, and the other in the Nashoba Valley, established in 1931. These are supported by grants from the Commonwealth Fund of New York secured by the initiative of Dr. Bigelow. There is need in other rural communities of the State for the strengthening of the local public health service. In 1928 legislation was enacted permitting towns to combine in health districts for the employment of a full-time, executive health officer and staff and this method should be extended.

It is desirable to consider to what extent preventive measures should be a function of the medical profession or of other agencies. In this connection it must be appreciated that the attention of physicians is primarily occupied in a personal service for the treatment of individual patients. An extension of their activities to include preventive measures is desirable. This may be brought about through a more intensive educational campaign by social and public health organizations which can more satisfactorily handle this aspect of the problem.

Existing medical facilities differ widely in different parts of the State and should be surveyed to determine the adequacy of the service. On the whole, however, it may be said that the volume of medical care is insufficient especially in semi-rural and rural districts largely on account of low income levels and consequent unwillingness to incur financial obligation.

In Boston, home medical service for the poor is furnished by three and maternity care by two organizations. The volume of the service may be indicated by the fact that in connection therewith over 300,000 visits were made in 1931 by the nurses of the Community Health Association. Mr. Wing of the Boston Dispensary estimated in 1930 that 260,000 individuals made 1,163,000 visits to Out-Patient Departments or Dispensaries in Boston.

The poor in the City are looked after, but there is a large group of persons of moderate means here and elsewhere for whom for financial reasons medical care is inadequate. The Baker Memorial Unit of this Hospital represents an effort to meet the needs of this group for hospital care.

It is undesirable with the data at hand to attempt to suggest the remedy. Further information regarding local needs and facilities and a careful consideration of the merits of measures suggested for relief will first be necessary. To what extent the two most important recommendations of the Committee, group service and group payment, are applicable cannot at present be decided. The large volume of free medical service for the poor modifies our local problem.

In the larger communities and many of the smaller places we already have groups organized about hospitals. The Staff of the Massachusetts General Hospital is one of many such groups and conforms to the suggestion of the Committee except for preventive service and complete home and office care on a group basis. The promotion of preventive measures by education of the public should, as I have already indicated, be a function of social and public health organizations. With respect to complete home and office care on a group basis, it seems desirable to consider how the field of usefulness of hospitals by this or other means can be further increased.

The recommendation by the majority that the

cost of medical care be placed on a group payment basis through insurance, taxation, or both, naturally excites apprehension. Tax funds in this State are available for certain special hospital facilities. Distribution after approval by the Department of Public Health affords opportunity for the insistence on proper medical standards and adequate physical equipment. Though, in general, payment by taxation entails the risk of political interference, this method deserves consideration as a partial solution of the problem for regions where the resources and income levels are low and the poor are inadequately cared for.

Twenty-four foreign countries have compulsory sickness insurance. The principal purpose at first was the provision of "cash benefits" for loss of wages from illness, but this has gradually changed to emphasis on medical treatment. Cash benefits tend to prolong illness and the Committee wisely insists on a separation between insurance against the cost of medical care and insurance against wage loss due to illness.

Voluntary coöperative health insurance offered by community medical centres seems desirable to consider as a method with which to experiment. To judge from previous experience, however, there is the danger that it will lead to compulsory insurance and the undesirable inclusion of cash benefits, and in any attempt to apply it insurance against wage loss due to illness should be excluded.

In conclusion let me say that as physicians we cannot be indifferent to the findings from the carefully conducted inquiry on the conduct and cost of medical care. The time has come when we should help to solve the problem of more adequate service for all.

DR. R. B. GREENOUGH: We are grateful to Dr. Bowers for the information he has given us relating to the investigations and the deliberations of the Committee on the Costs of Medical Care. The information they have collected and summarized in their many reports, is of the utmost value to the dispassionate consideration of the problem; but the recommendations of the majority and of the minority and of the various individuals should be regarded, not as formed and final conclusions; but as tentative suggestions for experiments in the way of special medical services which in suitable communities may be found to be effective.

The Committee lays itself open to criticism, I think in two respects; first, because it does not stress sufficiently in its report the fact that its majority recommendations are of such a tentative and experimental nature; and secondly, because it did not restrict its recommendations to those in which unanimity of opinion of all its members could be obtained. That some degree of unanimity was obtainable, is evident to the careful reader of the report, but he is under the necessity of studying it out for himself. When all is said and done, however, the points upon which the majority and minority groups do agree must be the starting point from which progress is to be made, if it is to be made at all. That some modification of the methods now in use for providing medical service is desired by the public, is abundantly evident today, and unless the movement to supply this want originates in and is guided by the medical profession, it is not improbable that it will originate elsewhere as it has in other countries.

While the subject is of course one which will affect most vitally the material and social welfare of the medical profession, it is not alone from that point of view that we can approach the problem. The medical profession still holds an enviable position in the community, and its services are widely honored and appreciated. This position must not be lost to us by an obstinate refusal to recognize that, with changing times and conditions, changes in our own methods may well be necessary in the interests of the community as a whole as well as of ourselves.

It is the practicing members of the medical profession, however, who by a lifetime of experience, have learned that there is danger to the patient and to the community in such forms of contract and corporate practice as are not directly governed by the code of ethics of the medical profession; a code which is established, not for the benefit or in the interest of the medical profession, but for the protection of the public. It is as true today as it ever was that "a man shall not serve two masters," and so far as the physician is concerned every other consideration must be subordinate to that of the welfare of his patient. If the organized medical profession will attack this problem and apply to it the knowledge which they, as physicians, have accumulated in the past, a wiser, safer, and more effective plan will be developed than if we withdraw our sympathies and our assistance from those who are devoting themselves to the problem, and assail them with vituperation.

It is a striking fact, that in three at least of the five majority recommendations the minority substantially agrees, namely, those which refer to (1) strengthening of public health services, (2) education of physicians and others concerned in the care of illness, and (3) the coördination of medical services.

To the practicing physician, it would seem, that under the recommendation dealing with education, reference might well have been made to the education of the public which spends nearly half a billion dollars annually for patent medicines and for the services of irregular practitioners and cultists. We must suppose, therefore, that one reason at least for the failure of the public to obtain adequate medical care is that, at the present time, they do not know enough to want it. Even in a fourth recommendation of the majority, dealing with the different forms of medical practice, there is substantial agreement under a number of different sections. It

is the strong recommendation of the majority report for the development of a form of group practice, which is as yet absolutely untried, which is the chief point on which the minority disagrees. On the fifth recommendation, relating to health insurance, either voluntary or compulsory, even the majority find it impossible to be unanimous.

It is thus clear to everyone that these problems demand further study and experiment. What greater service can the medical profession give to the community today than to take on this problem as its own, and to apply to its solution the best resources which it has available? The report of the Committee on the Costs of Medical Care stands today as a challenge to the medical profession of this country.

DR. ROBERT B. OSGOOD: *Mr. Chairman, Ladies and Gentlemen*—Whether we like it or not, all is not right with the costs of medical care. I cannot exactly quote the statement of the secretary general of the American Medical Association, but according to my memory it was to the effect that the most important problem which faces the medical profession today is the provision of adequate medical care for a very large proportion of the population at a cost within their resources.

If this is true, and there seems to be a well-informed opinion that it is true, what would be the first task to be accomplished by a representative Committee on the Costs of Medical Care? Obviously the ascertaining of facts as to the situation throughout the country. This task, I think we must admit, the Committee has very largely fulfilled and it was a Herculean task. We have never before had such an array of facts to aid us in working out a solution of the problem by which we are faced.

The auspices under which the Committee worked should inspire confidence in its findings. I think the same confidence may be reposed in the personnel of the members signing the majority report. The character of the members signing the minority report also deserves the closest attention.

Dr. Birnie in his careful analysis of the report calls attention to the number of "ifs" which modify the conclusions of the majority. These "ifs" are to my mind not a weakness but a strength. In the present state of our knowledge it would have probably been impossible to propose a concrete, hard and fast plan not conditional upon many vital changes yet to be made in existing medical and civic systems. In the present state of medical opinion it would certainly have been unwise to propose such a plan, and I fancy most of us would have been obliged to use more "ifs" than the Committee has employed. These very "ifs" suggest honesty and openmindedness.

Dr. Birnie also asks after studying the import of the conclusions "Why should we worry?" I feel that there is every reason why we should worry and debate and differ. Unless we continue to discuss this burning question and finally succeed in reaching a consensus, if not a complete unanimity of opinion, we shall be sadly unfaithful to the trust which the public has thus far placed in the medical profession. A great proportion of the public need help; no one disputes this fact. The public is watching us closely to see whether we will take steps to provide it or adopt a "laissez-faire" policy.

Sir Arthur Newsholme's studies have shown that in all the principal European countries some system of medical insurance has already been established and that there is a tendency for voluntary insurance to be changed into compulsory insurance. The hand seems to be writing rather fast on the wall and it behooves the organized medical associations to read this handwriting and inform themselves as to the evils as well as the virtues of the different insurance schemes. Sir Arthur also directs attention to the fact that in those countries in which organized medicine has been most alert and prepared, the systems adopted have been most advantageous to both physicians and patients and have tended to keep medical practise on the high plane that we all desire. The systems in which organized medicine has taken a hand in planning have tended to safeguard that personal relationship between physician and patient which we all recognize as of utmost importance to both.

It is not at all unlikely that unless our National and State medical associations do study and prepare, we shall be obliged to meet legislation introduced by a justly interested laity and placed on the statute books as law. Such laws may be less easy to ignore than the 18th Amendment and perhaps harder to repeal.

I feel that those of us who have "sat by," owe warmest thanks to the Committee for its patient hard labor of five years and for presenting, in so fairminded a manner, the conclusions which are set forth in the majority report. Dr. Bowers' most excellent summary of this report shows how very few essential differences exist between the conclusions of the majority and those of the minority, differences perhaps more of spirit than of nature.

DR. JAMES H. MEANS: *Mr. Chairman*—This attractive red book which I hold in my hand, namely the Committee's report, I think every doctor should read. We may not all of us agree with all the recommendations but at least we should have an open mind on the subject. We should be willing to try experiments, which is one of the things the report asks us to do.

Dr. Birnie has described to us what a difficult undertaking it would be for the Massachusetts General Hospital to attempt to carry out the kind of development which the Majority Report proposes. To be sure it would be difficult, but I believe nevertheless that we may be equal to it. At least I hope we shall try.

I think, Mr. Chairman, you have done well to call together men with different points of view to discuss these matters with seriousness. This method stands out in marked contrast to the closed minded stand pat-ism of A. M. A. headquarters and seems to me to be a more intelligent way of meeting the problem.

Dr. George H. Bigelow: I feel that the studies of the Costs of Medical Care which, as Dr. Bowers indicated, are really more important than the summary volume: (1) that a large number of persons are getting inadequate service at what for them is excessive cost; and (2) that a large number of those giving this service, including doctors, nurses, hospitals, etc., are being inadequately remunerated.

Such a situation as this, where a product is paying the producer too little and costing the consumer too much inevitably means change and of course, as has been pointed out ad nauseum, the problem is whether this change shall have professional guidance.

As a health officer I am particularly interested in that aspect of the recommendations which would take out of the hands of official health departments those clinical and pseudo-clinical activities which have increased of late years and have been the principal cause of misunderstanding between practitioners and health officers. Under the program recommended in the report, such activities as active immunization against disease, periodic physical examinations, the correction of defects, the early detection of disease, and the like would be adequately provided. This would leave the health officer plenty to do in the field of environmental control, laboratory service, vital statistics and epidemiology, and health education, and would go a long way toward straightening out misunderstandings.

Dr. Richard M. Smith: Dr. Bowers has spoken fully for the work of the Committee and I have very little to add. I should, however, like to emphasize what he has already said that the important contribution of the Committee is the presentation of factual data. The final report indicates only constructive thinking on the basis of these facts. It is quite evident that there must be some modification in medical practice in order to make available to more people the advantages of the advances in medical knowledge and also to furnish better compensations to those individuals and agencies rendering the service. That the hospital furnishes the most satisfactory base from which further developments may take place, seems to me sound. The details of how these developments shall proceed will vary greatly in different localities and any plan must be adapted to meet local conditions. Judging from the experience of other countries, we are bound to have some form of insurance to help meet medical costs. It is important that the medical profession assume leadership in developing the forms of insurance which are adopted and to assume administrative control of the distribution of funds. There are bound to be differences of opinion in the details of any plan which is proposed. It is essential, however, that we think constructively on these matters and attempt to arrive at a solution which will be of benefit not only to the medical profession but to the public at large.

In closing the discussion, Dr. Bowers stated that compulsory health insurance is likely to be put into operation unless the medical profession steps in and exerts coöperative control respecting plans for dealing with the evident purposes of those who are planning to impose legalized forms of insurance.

BROOKFIELD MEDICAL SOCIETY

The Brookfield Medical Society held its four hundred and ninety-eighth regular meeting at Louise Galloway's in Brookfield on Wednesday, February 15, with Dr. Charles A. Deland host and Dr. W. Irving Clark, of Worcester, speaker, who had for his subject "The Report of the Committee on the Costs of Medical Care." It was an extraordinarily comprehensive presentation and was discussed freely by the twenty members present.

J. R. Fowler, M.D., *Sec'y.*

THE BOSTON HEALTH LEAGUE

The Annual Meeting of the Boston Health League will be held Thursday, March 9, 1933, 6:30 P.M., at the Twentieth Century Club, 3 Joy Street, Boston.

The final Report of the Committee on the Costs of Medical Care will be presented by Dr. Richard M. Smith, and discussed by Dr. Roger I. Lee, Dr. Frederick H. Washburn, Mr. Malcolm Donald and Dr. George C. Shattuck.

Dinner, $1.00. Reservations should be made by March 6, at the Boston Health League, 43 Tremont Street, Boston.

The speaking will begin promptly at eight, for which there is no admission fee. If it is not possible to attend the dinner, you are cordially invited to hear the speaking. The meeting is open to the public.

AMERICAN GYNECOLOGICAL SOCIETY

Program of the Fifty-Eighth Annual Meeting, Shoreham Hotel, Washington, D. C., May 8, 9, and 10, 1933

Address of the President
Dr. Floyd E. Keene, Philadelphia, Pa.

1. "Management of Posterior Occiput Position." Dr. John R. Fraser and Dr. G. C. Melhado, Montreal, Canada.
2. "The Importance of Recognizing Male Stigmata in the Architecture of the Pelvis in Obstetrics and Gynecology." Dr. W. E. Caldwell and Dr. Howard Malloy, New York, N. Y.
3. "The Fothergill Operation for Prolapse." Professor William Fletcher Shaw, Manchester, England. (By Invitation.)

4. "What Has Been Learned by Pelvic (Rectal) Examination of the Female Monkey." Dr. Carl Hartman, Baltimore, Md. (By Invitation.)
5. "An Evaluation of the Bissell Operation for Uterine Prolapse Based on a Follow-up Study." Dr. Byron H. Goff, New York, N. Y.
6. "A Series of Breech Deliveries with Reference to X-ray Measurements of the Fetus and Maternal Pelvis" Dr. Thomas R. Goethals, Boston, Mass. (By Invitation.)
7. "Prevention of Cancer of the Cervix Uteri." Dr. Harry S. Crossen, St. Louis, Mo.
8. "Radiation Therapy in Carcinoma of the Corpus Uteri." Dr. William P. Healy, New York, N. Y.
9. "Advanced Carcinoma of the Cervix; Postmortem Studies." Dr. Charles A. Behney, Philadelphia, Pa. (By Invitation.)
10. "An Analysis of a Series of Non-Convulsive Cases of Toxemias of Pregnancy:
    Part I. Clinical Observations." Dr. Fred L. Adair, Chicago, Ill.
    Part II. "Comparative Blood Studies." Dr. William J. Dieckmann, Chicago, Ill. (By Invitation.)
11. "The Results of a Series of Myomectomies." Dr. Hilliard E. Miller, New Orleans, La.
12. "Further Studies of the Fascia Surrounding the Vagina." Dr. Nathan P. Sears, Syracuse, N. Y. (By Invitation.)
13. "A Report of a Young Ovum." Dr. Jennings C. Litzenberg, Minneapolis, Minn.
14. "The Response of the Human Ovary to Anterior Pituitary Hormone." Dr. Samuel H. Geist, New York City.
15. "End Results in Treatment of Pelvic Infection." Dr. Albert H. Aldridge, New York City. (By Invitation.)
16. "Ovarian Tumors Associated with Secondary Sex Changes." Dr. Emil Novak, Baltimore, Md.
17. "Endometrial Hyperplasia and its Relation to Endocrine Dysfunction." Dr. James E. King, Buffalo, N. Y.
18. "Nephritis and Pregnancy." Dr. J. R. Goodall, Montreal, Canada.
19. "Determination of Sex in the Unborn." Dr. Frank W. Lynch, San Francisco, Calif.

Among the guests who will lead in the discussion are the following: Dr. Howard C. Taylor, Jr., New York City; Dr. William E. Studdiford, New York City.

SCIENTIFIC EXHIBIT

Arrangements are being made for a Scientific Exhibit during the meeting, to be under the direction of Dr. Joseph L. Baer.

Secretary: Dr. Otto H. Schwarz, St. Louis, Mo.

FRACTURE MEETING

There will be a conference under the auspices of the Fracture Service, Massachusetts General Hospital, Friday evening, March 3, at 8 o'clock, in the Lower Out-Patient Amphitheatre.

SUBJECTS

Fractures of the Upper End of Tibia. Dr. Barr.
Fractures of the Pelvis. Dr. Young.
Shoulder Dislocations. Dr. H. Rogers.
House-officers, students and visitors welcome.

PHILIP D. WILSON, M.D., *Associate Chief.*

NEW ENGLAND PEDIATRIC SOCIETY

FRIDAY, MARCH 3, 1933

AFTERNOON SESSION

Children's Hospital Amphitheatre, 4:00 P.M.

1. Presentation of Patients (Surgical). Dr. William B. Ladd.
2. Presentation of Patients (Orthopedic). Dr. Frank Ober.
3. Renal Rickets. Dr. Edward C. Vogt.
4. A Simplified Baby Carrier for Infants. Dr. Eugene C. Peck.
5. Presentation of Patients (Medical). Dr. Kenneth Blackfan.

EVENING SESSION

Boston Medical Library, 8:00 P.M.

Medical Supervision of Normal Children Under School Age

A Meeting to Discuss the Existing Activities of the Private Practitioner and Public and Private Agencies in the Field of Infant and Child Care.

1. Modern Concepts of Its Scope. Dr. Harold Stuart.
*2. Present Extent of Its Application. Dr. Philip Van Ingen, New York.
3. Needed Changes in Current Practice. Dr. Lewis Webb Hill.
4. Discussion.

THOMAS A. FOSTER, *President,*
GERALD HOEFFEL, *Secretary.*

*Based on National Survey of Preventive Service Conducted Under Auspices of White House Conference on Child Health and Protection.

SOCIETY MEETINGS
CONGRESSES AND CONFERENCES

March 3—Fracture Meeting. See notice elsewhere on this page.

March 3—New England Pediatric Society. See notice elsewhere on this page.

March 3—The American Society for the Control of Cancer. See page 403, issue of February 16.

March 5—Harvard University. Free Public Lecture on Medical Subjects. See page 511.

March 7—Joint Meeting of the Greater Boston Medical Society and the Beth Israel Hospital. See page 524.

March 9—Clinics in Medicine at Peter Bent Brigham Hospital. See page 511.

March 9—Boston Health League. See page 516.

March 10 - May 12—William Harvey Society. See notice on page 765, issue of October 27.

March 15 - May 17—New England Physical Therapy Society. See notice on page 1010, issue of December 1.

April 1 and June 13—The American Board of Obstetrics and Gynecology. See page 233, issue of January 26.

April 5—New England Heart Association. See notice on page 1011, issue of December 1.

May 8, 9, and 10—American Gynecological Society. See page 516.

October 9-12—American Public Health Association. See page 403, issue of February 16.

DISTRICT MEDICAL SOCIETIES

ESSEX NORTH DISTRICT MEDICAL SOCIETY

May 3—Wednesday, Annual Meeting. Program to be announced.

ESSEX SOUTH DISTRICT MEDICAL SOCIETY

Tentative Program

Wednesday, March 8, 1933—Lynn Hospital. Clinic 5 P. M. Dinner 7 P. M. Speaker: Dr. Soma Weiss, Boston City Hospital. Subject: Arterial Hypertension.

Wednesday, April 5, 1933—Essex Sanatorium, Middleton. Clinic 5 P.M. Dinner 7 P.M. Speaker: Dr. Wilson G. Smillie, Professor of Public Health Administration, School of Public Health, Harvard University. Subject: Common Colds.

Thursday, May 4, 1933—Censors' Meeting, Salem Hospital. 3:30 P. M.

Tuesday, May 9, 1933—Annual Meeting. Salem Country Club, Forest Street, Peabody. Golf in afternoon; greens fee $2.00. Dinner at 7 P. M. Speaker: Dr. George Burgess Magrath. Subject to be announced later. Ladies invited.

R. E. STONE, M.D., Secretary.

FRANKLIN DISTRICT MEDICAL SOCIETY

Meetings will be held at the Weldon in Greenfield on the second Tuesday of March and May.

CHARLES MOLINE, M.D., Secretary.

MIDDLESEX EAST DISTRICT MEDICAL SOCIETY

The program of the Middlesex East District Medical Society is as follows:

March 15 at Melrose.

May, at the Meadowbrook Club, Reading.

ALLAN R. CUNNINGHAM, M.D., Secretary.

NORFOLK DISTRICT MEDICAL SOCIETY

March 28, 1933—Time, place and subject to be announced. Speaker will be Dr. J. P. O'Hare.

May—Annual Meeting. Time, place and subject to be announced.

FRANK S. CRUICKSHANK, M.D., Secretary.
1695 Beacon Street, Brookline.

SUFFOLK DISTRICT MEDICAL SOCIETY

Wednesdays at 8:15 P. M.

March 29, 1933—Clinical Program, Massachusetts General Hospital.

April 26, 1933—Annual Meeting. Election of Officers. Scientific Program—Titles and speakers to be announced later.

The Medical Profession is cordially invited to attend these meetings.

WILLIAM H. ROBEY, M.D., President,
LELAND S. McKITTRICK, M.D., Secretary.

WORCESTER DISTRICT MEDICAL SOCIETY

Wednesday, March 8—Dinner and scientific program at the Memorial Hospital, Worcester.

Wednesday, April 12—Dinner and scientific meeting at the Rutland State Hospital. Scientific program to be announced later.

Wednesday, May 10—The Annual Meeting. Place and program to be announced later.

ERWIN C. MILLER, M.D., Secretary.

BOOK REVIEWS

Functional Disturbances of the Heart. By HARLOW BROOKS. Everyday Practice Series. J. B. Lippincott Company, Philadelphia and London, 1932, 288 pages. Price $5.00.

Functional disturbances of the heart have been discussed by Dr. Harlow Brooks in this handbook of the Everyday Practice Series under eleven chapter headings as follows: 1) Recognition of Functional Disturbances of the Heart, 2) Examination of the Heart, 3) Taking the History, 4) Effects of the Emotions on the Normal Heart, 5) Anxiety Angina, 6) Gastric Distention and Flatulence, 7) Cardiac Exhaustion, 8) Heart in Early Hyperthyroidism, 9) Cardiac Neuroses, 10) Paroxysmal Tachycardia, and 11) Neurocirculatory Asthenia.

The subject of functional disturbances of the heart is an important and interesting but difficult one and needs, as the author says, considerably more study and analysis. In the first few pages the author emphasizes the inadequacy of our knowledge of the subject, but it would have been well to have appended a bibliography of the more valuable contributions for reference, particularly since mention is made of a considerable number of writers on this subject.

The chapter on neurocirculatory asthenia contains much of interest and practical importance and should prove to be the most useful part of the book, but scattered through the other chapters there are also valuable observations worthy of note, for example the paragraph on *Impartial Attitude* on page 29, the second paragraph on *Value of the History* on page 40, the great reward from proper handling of a patient with a functional disturbance of the heart (top of page 46), the importance of sufficient rest and sleep (page 69), and the case report on pages 185 to 187. There is an unfortunate tendency to belittle the ability of the cardiologist in handling "functional" cases; the experience of the well-trained cardiologist should make him actually more capable than the general internist in the proper handling of these cases since the cardiologist meets such cases daily.

There are a few corrections to be suggested. On page 61 it is stated that the diagnosis of true heart disease is fatal to artistic success. This should not be so if the patient is properly handled and he or she is not seriously affected. In Chapter V the term anxiety angina is an unfortunate one for exactly what we want to do is to avoid confusion between the pain of neurocirculatory asthenia, which is well described on page 77, and that from angina pectoris, which is much more important and usually very different, consisting of a strangling or oppressive sensation substernally. Chapter VII entitled Cardiac Exhaustion belongs better in Chapter XI as Nervous Exhaustion under Neurocirculatory Asthenia for it isn't really myocardial insufficiency or exhaustion that is described. In the treatment of hyperthyroidism, the curative value of early operation should be mentioned. Finally, most cardiologists and internists, too, would probably take exception to the statement on page 159 that "There is probably no subject in cardiology of more present day interest both to the general practitioner and to the specialist than that of Paroxysmal Tachycardia." Rheumatic heart disease, coronary thrombosis and neurocirculatory asthenia itself doubtless deserve more attention and would receive more votes.

With the qualifications made above the book should prove helpful to the general practitioner for whom it is intended.

The Use of Lipiodol in Diagnosis and Treatment. By J. A. SICARD, Late Professor in the Faculty of Medicine, Paris, and Physician at the Necker Hospital, and J. FORESTIER (Aix-les-Bains). Oxford University Press, 1932. Cloth. 235 Pages. Price $4.00.

This is an English translation of a book on the use of lipiodol (iodized oil) in diagnosis and treatment. The subject is dealt with both from the clinical and radiological aspects.

Chapter one deals with the composition and properties of lipiodol, the physiology and general technique of the administration, radiological technique, and general indications and contraindications.

The second chapter is devoted to the use of lipiodol in the subarachnoid and epidural spaces.

Chapter three deals with bronchopulmonary cavities.

Chapter four covers the use of lipiodol in the male and female generative systems.

Chapter five includes the blood vessels, abscesses and sinuses, nasal sinuses, lacrymal ducts, a few minor applications, and the estimation of secretory activity of the stomach.

Chapter six is devoted to the therapeutic use of lipiodol.

The introduction of lipiodol into radiological diagnosis has been a definite step in advance. This book covers briefly and concisely the numerous uses to which it may be put. The text is well written and makes very easy reading. The book is unusually well illustrated and the reproduction of the radiographs is excellent. The work reflects the great enthusiasm and technical skill of the authors.

Children's Tonsils In Or Out. A Critical Study of the End Results of Tonsillectomy. By ALBERT D. KAISER, M.D., Associate Professor of Pediatrics, University of Rochester Medical School; Chief Pediatrician, Rochester General Hospital; Pediatrician, Rochester Dental Dispensary. J. B. Lippincott Company, Philadelphia. Price $5.00.

Under this challenging title Dr. Kaiser has set down at length his views on the controversial subject which has occupied so much of his attention and interest for years. Where others have based their statistics on hundreds of cases he has done so on thousands, drawing his conclusions with a fairmindedness that has already made his opinion on the subject authoritative.

Starting this volume with an historical opening chapter and chapters on anatomy and physiology and bacteriology by Konrad E. Birkhaug, M.D., he proceeds to a discussion of the symptomatology of pathological adenoids and tonsils, adenoid obstructions and the relation of tonsillitis and sore throat to tonsils. He finds no close relationship, as others have discovered to their confusion, between the occurrence of colds and the presence or absence of tonsils and adenoids. Children who develop laryngitis, bronchitis and pneumonia secondarily to attacks of tonsillitis may be relieved by tonsillectomy; other children appear more likely to develop those infections if the lymphoid tissue is removed from the nasopharynx.

The importance of adenoids in otitis media is stressed; an importance which lessens with increasing age. Tonsillectomy seems to have little effect on the severity of scarlet fever, but the susceptibility to diphtheria seems to be considerably decreased after tonsillectomy. The operation seems to help in preventing carditis after chorea, and in preventing rheumatic fever, but not the conditions following rheumatic fever. It is advised after acute nephritis and in recurrent or chronic pyelitis.

In general it improves nutrition, if nutrition had been poor preceding operation. The operation is of no value in allergic conditions. It is advised in cyclic vomiting, the attacks of which were favorably influenced in about 45 per cent of the cases studied. Irradiation is of occasional value in granular throat, but its effect on diseased tonsils is not permanent.

The chapter on the tonsils in scarlet fever, diphtheria and other communicable diseases is contributed by William L. Bradford, M.D.; that on asthma and hay fever by Stearns S. Bullen, M.D., that on the tonsils in diabetes mellitus by Charles B. F. Gibbs, M.D., and that on surgical consideration of incomplete tonsillectomies, and significance of lymphoid hyperplasia by Edwin S. Ingersoll, M.D.

No topic which impinges in any way on the tonsils and adenoids seems to have been neglected, making the work indeed an authoritative one. Valuable as it is, it is unfortunately difficult reading.

Excitability. A Cardiac Study. By W. BURRIDGE, D.M., M.A. Oxon. Professor of Physiology, Lucknow University. Oxford University Press, London, 1932. Pp. 208, including bibliography and index. Twenty-five chapters. Price $3.85.

It is difficult to place this volume in the general field of Medicine since it has no clinical meaning and its physiology is made to elaborate itself into a psychological system based upon the activity of the frog's heart when perfused with various concentrations of Ringer's solution.

The effects of the salts of calcium and potassium on the heart are extensively discussed and the author refers to an experiment of his in which the heart of a frog was shown to be able to beat on the fourth day after perfusion with 40 per cent solution of alcohol in Ringer—a record for perfused hearts. The experiment appeared to indicate that 40 per cent alcohol was a strong cardiac stimulant as well as a strong cardiac depressor.

This is an example of the evidence from which the author builds his physiological psychology of duality which becomes increasingly difficult to understand as it acquires the peculiar vocabulary of "baresis", "kinesiphores", and "hysteresial change".

The book is brightened with homely similes and the experimental evidence as presented is at least stimulating but one suspects that fact has been

confused at times with prophecy. It is not to be recommended for somnolent evening reading.

The bibliography contains 78 references, 42 of which are from the author of this book.

The index is adequate but illustrates the unusual phrasing of the book by such references as "Nature's mint, type of coinage", and "Roof-hitting simulates sympathetic nerve stimulation."

The Cardiac Output of Man in Health and Disease. By ARTHUR GROLLMAN, Ph.D., M.D., Johns Hopkins Medical School. Published by Charles C. Thomas, Springfield and Baltimore, 1932. Price $4.00.

This book reviews the earlier literature on cardiac output, analyzing the data given by all methods in the light of the results obtained by the use of the author's acetylene method. There is a preponderance of self-assurance in the attempt to leave no doubt in the mind of the reader that the final method for the determination of cardiac output is now available. The merit of the acetylene method is considered proved because of the consistency of its results and because cardiac output records thus obtained agree closely with output figures obtained by direct cardiac puncture. It must be said that the method, in common with older methods, requires coöperation of the subject and depends upon the attainment of an equilibrium in the lungs between a foreign gas in the lungs and in the blood. For this reason it is likely that the method will fail in sick patients exhibiting marked congestion of the lungs, and some doubt is expressed by the author himself as to the applicability of the method during severe muscular exercise.

A close correlation between surface area and cardiac output is demonstrated. Studies are presented showing the effect upon cardiac output of changes in posture, ingestion of food and fluids, sleep, psychic disturbances, temperature, effects of high altitude, anemia, alcohol, caffeine, tobacco and a number of drugs including epinephrine and the nitrites. The effects upon cardiac output of massage, baths and ultraviolet radiation are considered. The possibilities of clinical application of the method are pointed out.

The book should be of great use to students of the subject and of interest to physicians imbued with the desire to keep up with advancing knowledge of physiological mechanisms in the body. A bibliography of 483 references is listed.

The Heart Rate. By ERNST P. BOAS and ERNST F. GOLDSCHMIDT. 166 pages. Charles C. Thomas, Springfield, Illinois, 1932. Price $3.50.

Boas and Goldschmidt have presented, in a book of 166 pages with 65 figures, a consideration of the heart rate in man that begins with an interesting historical review of the estimation of the rate of the pulse, takes up next the description of their cardiotachometer, an instrument which by electrical amplification automatically records the pulse rate over considerable periods of time, then continues with a discussion of the normal heart rate under varying conditions, especially during sleep, and closes with a brief chapter on the heart rate in disease.

The appendix contains some tables and a bibliography of 180 references.

The book supplies useful data especially on the normal basal pulse rate and on the variations that are normally possible under various conditions. These data add little that is new but their extent and accuracy give valuable confirmation to previous conclusions. A considerable expansion of the brief account of the heart rate in disease would add considerably to the value of the book.

It is of interest that over two hundred years ago Sir John Floyer, in 1707, wrote of the wisdom of determining the basal pulse rate "the natural healthy pulse in every person—by observing the morning pulse before eating, exercise, or other external accidents disturb it". The present authors found that the average basal rate in men was 61.4 per minute with an average minimum sleeping rate of 52.7 and average minimum waking rate of 61.15, while in women the average basal rate of 69.9 with average minimum sleeping rate of 57.7 and average minimum waking rate of 67.1. The authors write further as follows: "We have frequently observed minimum sleeping rates of from 40 to 45, and in a number of cases rates of 38 and 39. Benedict (19) recorded many instances of heart rates ranging from 29 to 39 a minute in subjects who had been on a reduced diet for many weeks, and showed by electrocardiographic records that such rates are compatible with normal sinus rhythm." The range of heart rate in a given individual during an ordinary day may be very great. In one case (No. 64) the heart rate rose to 173 while he was running and fell to 41 during sleep, giving a total range of 132 beats. The authors found further that the more rapid pulse is not necessarily the more unstable pulse.

"From a study of the correlation between the minimum and average heart rate during sleep, as well as of the basal heart rate, with age, height, sitting-height, weight, chest-circumference, and body surface; and from a study of the relationship between the minimum heart rate during sleep and the teleroentgenogram, the electrocardiogram, as well as the body habitus" the authors conclude "that there is no correlation between the heart rate and these bodily measurements". They further believe that "it is unlikely that any anatomic measurement will be found that bears a direct relationship to heart rate". The fastest pulse rate in a normal person recorded by the authors was 204 in a boy of thirteen after exhausting exercise for two and one-half minutes. The highest rate that they had seen reported was 246, after thirty minutes of exhausting exercise which resulted in collapse. It has been reported further that after heavy work the pulse rate in a normal person may remain high for many

hours. Studying was not found to cause an acceleration of the heart rate.

Investigation of the heart rate during anesthesia showed that fluctuations in rate are closely linked to the depth of the anesthesia; when the anesthesia becomes light, the heart rate quickens. Once the patient is well anesthetized, the heart rate is remarkably constant and is little influenced by manipulations of tissues or viscera, except that strong stimuli tend to slow the rate. In disease a rapid pulse during sleep may give the only indication of persisting infection or other active trouble. One more observation of especial interest made by the authors is the following (page 136): "Patients with auricular fibrillation may be classed in two groups; those with a labile and those with a relatively stable ventricular rate. Individuals with labile ventricular rates are usually high-strung and nervous; they correspond to individuals with normal rhythm and neurocirculatory asthenia."

Laboratory Service and the General Practitioner. By ARNOLD RENSHAW, M.D. Humphrey Milford, Oxford University Press. London. 1932. Pp. 267. Price $2.50.

This small handbook is divided into twenty sections, ranging from the examination of various body excretions to the planning of insulin dosage in diabetes. Two appendices are included, one an alphabetical list of the more important diseases and symptoms with a note under each as to what type of examination is desirable. This appendix could have been made still more valuable by condensed information as to the approximate results of the laboratory tests. Appendix two is a very brief outline of the Aschheim-Zondek test.

Details of procedures are not given at all but simply brief statements as to what tests are desirable to do in given conditions. Occasionally the expected results of the tests, together with the normals, are given in association with the tests themselves. Not infrequently, however, a rather inconvenient arrangement of having the normal and abnormal findings given in general tables is adopted. In the one covering the chemistry of the blood, the table shows simply maximum and minimum pathological ranges without any indication as to the conditions in which they exist.

The section on investigation of a tumor, using tumor in the broader sense, is decidedly inadequate, stressing the Wassermann reaction, certain of the flocculation reactions for syphilis, the Pirquet reaction, and very sketchy hints of biopsy.

While the volume will probably be of moderate use to the busy practitioner, nevertheless because of the aim to cover a wide field and yet to keep the volume to a small size, it is inadequate for the purposes of the man who really needs to use it. That is, the man who needs to have the various laboratory tests of value in a given condition suggested to him also needs far more full statement as to the findings in the tests and their significance. To one familiar with laboratory procedures the book would be adequate but its use unnecessary.

Primary Carcinoma of the Lung — Bronchiogenic Cancer. A Clinical and Pathological Study in Two Parts. By B. M. FRIED. Baltimore. 1932. Williams & Wilkins Co. Price $5.00.

But a few years ago a diagnosis of primary carcinoma of the lung was made only rarely and then with considerable uncertainty; today this disease is recognized with relative frequency and in most instances the diagnosis can be established with accuracy before death. The publication of a monographic treatise is therefore to be regarded as a timely and valuable contribution to the literature of clinical medicine.

On the whole, the monograph is a carefully prepared, well-illustrated treatise that will stimulate further study and discussion of its very important subject matter. The author discusses the pathological characteristics of the disease as well as the clinical, illustrating both phases of the subject by a series of forty-seven cases that are presented in considerable detail. His conclusion regarding the much debated increase in the incidence of the disease is that this increase is very likely more apparent than real. It is believed that improved clinical and pathological methods of diagnosis and an increased attention to this particular malady, combined with the increase in span of human life, a factor that distorts all cancer statistics, are sufficient to account for the apparently increasing incidence.

The author holds an extreme view regarding histogenesis that in all probability will not find universal acceptance among pathologists. In conformity with his previously published observations that the air sacs of adult human lungs are lined not by epithelial cells but by macrophages of mesenchymal origin, he excludes the alveoli as a possible source of epithelial malignant disease. In the author's opinion only the basal cells of the bronchial mucous membrane are concerned in the genesis of primary pulmonary carcinoma.

The protean clinical aspects of primary carcinoma of the lung are well described by the illustrative case histories presented in detail. Attention is particularly directed to the observation that the course of the disease is frequently more protracted than the prevalent clinical impressions indicate. The conception of the duration of the disease is changing with its recognition at earlier stages and must be carried in mind in giving a prognosis or in judging the results of radiation therapy.

The emphasis placed upon intracranial metastases is a natural result of the source of much of the clinical material, for many of the patients entered the Peter Bent Brigham Hospital with the diagnosis of primary brain tumor. Approximately one-third of the cases reported in this monograph fall into this category; the autopsy table for many years

past was the source of an almost equal number; and among the cases recognized clinically because of symptoms attributable to the primary tumor the diagnosis was almost invariably delayed. These facts color the author's statement that primary carcinoma of the lung possesses a vigorous metastatic power. In point of fact, this impression must be held subject to moderation as data are assembled from clinics in which patients present themselves for pulmonary symptoms and as the modern diagnostic procedures are employed with increased frequency.

The pessimistic view of the disease drawn from the series of cases studied probably accounts for the complete omission of any discussion of treatment. It is to be hoped that treatment may be the next chapter to be unfolded in the study of such a distressing malady.

Bailey's Text-Book of Histology. By Adolph Elwyn, Oliver S. Strong et al. Eighth Edition. Published by William Wood & Co., Baltimore. Price $5.50.

It may be taken for granted that a text-book of histology in the eighth edition, revised and rewritten by seven members of the Faculty of the College of Physicians and Surgeons of Columbia University, is good and adequate for teaching purposes, and as an ordinary book of reference.

This book is one of the three standard text-books of histology, the others being Bremer's Edition of Lewis and Stöhr's Text-Book of Histology and Maximow's and Bloom's Text-Book, the most recent of the three. All of these three books give clear indication that histology is still a developing subject. The present edition of Bailey's Text-Book gives much more space to nerve tissue and the nervous system than either of the other two. In fact, 152 pages of the total of 700 pages of text are devoted to these subjects, while an additional 37 pages are given to the allied subjects of the organs of special senses. This does not mean that the rest of the book is not adequate. The illustrations are in the main excellent, the descriptions pertinent and concise, and short paragraphs on function represent a desirable innovation for a text-book of histology.

Compared with Bremer's Edition of Lewis and Stöhr, it is somewhat deficient in the accounts of histogenesis and embryology. References to the literature of subjects are omitted, as they are in most text-books of histology, Maximow being an exception in this regard. Text-books of histology differ from one another according to the distribution of emphasis upon component parts of the subject, and it is natural that aspects which are receiving most attention from investigators should receive emphasis.

The reviewer commends particularly the chapter on "The Living Cell", although he cannot refrain from expressing the opinion that it would be more stimulating with well-selected references. The account of the Hypophysis Cerebri is very much better than that of the Thyroid, from which the embryology has been entirely omitted. It is gratifying to find an account of the postnatal involutions of the adrenals in a text-book of histology.

The description of the teeth and their development is decidedly better than in most text-books. All in all, it is not possible to get very enthusiastic about a text-book of histology. In comparing different text-books one takes into consideration the groups of students to whom appeals may be made. A perfectly balanced text-book if kept within reasonable size is apt to be colorless. On the other hand, too great emphasis on subjects undergoing most active development is apt to be accompanied by important gaps. The present text-book has color because of the distribution of emphasis. It has no particularly weak points and is generally excellent throughout. It can be highly recommended for use in first-class medical schools and as a book of reference for those who wish to refresh their knowledge of histology. Emphasis here should be placed on the outstanding excellence of the treatment of the nervous system.

Community Health Organization. A manual of administration and procedure for cities of 100,000 with suggested modifications for larger and smaller urban units. Edited by Ira V. Hiscock, Professor of Public Health, Yale School of Medicine. Published by the Commonwealth Fund, New York, 1932. Price $2.50.

The object of this publication is stated in the "Foreword" as follows:

> "This volume is sponsored by the Committee on Administrative Practice of the American Public Health Association and reflects the judgment of that Committee after twelve years of study as to the scope and content of desirable municipal health services. The Commonwealth Fund takes pleasure in publishing it in the belief that it will prove a valuable instrument in the hands of official and voluntary health workers for the furtherance of sound public health development."

The presumed health needs of a community are considered under the following chapter headings: The government and public health, the planning of community health work, organization and administration, popular health instruction, vital statistics, communicable disease control, venereal disease control, maternity and child hygiene, school hygiene, public health nursing, milk and food control, sanitation, laboratory service, special problems, hospitals, and out-patient facilities, voluntary health service, and financial aspects of community health work.

This publication is a valuable exposition of current opinion as to what ought to be done by a community for the promotion of public health and, to a certain extent, how it should be done. The book should be read by every public official and can be

read with profit by anybody engaged in public health work.

It comes out squarely with a definite community health program backed by men who have given the subject long study and on this account is of unusual interest even to those who believe that due allowance is not being made by exponents of "preventive medicine" for the present limitations of our biological knowledge, and to those who may question whether it would not be better public policy to make people do for themselves some things which the program proposes to have attended to by public officials.

The book ends naturally with a discussion of the "inadequacy of present expenditures" and makes the customary complaint that a rightful proportion of public appropriations is not being devoted to public health purposes.

The Surgical Clinics of North America. Volume 12, Number 4. August, 1932. Mayo Clinic Number. W. B. Saunders Company, Philadelphia.

The outstanding characteristic of this issue is the reporting of a large number of unusual cases chosen from the wealth of material available at the Mayo Clinic.

Although the cases are all interesting and the histories are given in detail, in some instances a more complete discussion might make them of more practical value.

Henderson presents a classification of fractures of the ankle and introduces the term "trimalleolar" to distinguish a type with fracture of the internal, external, and posterior malleoli with displacement of the talus laterally, or posteriorly or both. The treatment is outlined.

New and Havens report some unusual tumors of the nose and illustrate their technic for removal of these by diathermy following lateral rhinotomy.

Sheard describes an improved type of artificial larynx for use after total laryngectomy. It can be adjusted for each individual and is more flexible than previous models.

Learmonth reports three interesting cases of peripheral nerve tumor, a sarcoma, a lipoma, and a recurrent Recklinghausen's tumor.

Transurethral resection of the prostate is discussed by Bumpus. He uses an instrument based on the Braasch cystoscope equipped with a tubular knife and multiple needle electrode. It has been used in 40% of their prostatic cases with satisfactory results.

Essex and Lundy discuss some of the problems of spinal anesthesia. They report their experience with pantocain, which gives an anesthesia of twice the duration of that produced by procaine.

The Gold-Headed Cane. By WILLIAM MACMICHAEL, M.D. Froben Press, Inc., New York. 6th edition, 1932. xxxi + 223 pages. Price, $3.50.

The "Gold-Headed Cane" was originally published in London in 1827. This is the sixth edition and is a reprint of the second edition, issued in 1828. That there is a real interest in this unusual story by William Macmichael is evidenced by the fact that three editions appear to have been necessary to supply the demands of the public since 1915. In this issue of the well-known work there are added data in regard to Macmichael's family, a reproduction of his portrait, and photographs of members of his family. The makeup of the book is not so pleasing as the edition of 1915, published by Hoeber, with an introduction by Sir William Osler. In general, however, the appearance of the book is satisfactory and the editing seems to have been carefully done.

An Empire Problem: The House and Village in the Tropics. By D. B. BLACKLOCK, M.D., Professor of Parasitology, Liverpool School of Tropical Medicine. The University of Liverpool. 1932. The University Press of Liverpool. Hodder & Stoughton, Ltd., London. Price 3 shillings and sixpence.

The author, Dr. Blacklock, is Professor of Parasitology at the School of Tropical Medicine in Liverpool. Through long residence in the tropics, where he has made valuable contributions to medical science, he has gained personal experience of tropical conditions affecting health. He has been impressed on the one hand by the advance of medical knowledge and on the other by the lag in application of this knowledge for the betterment of health in the tropics. Believing that business enterprises might derive great profit indirectly from improvement of the physical and economic conditions of the native, he urges that business undertake large programs for the betterment of health in the British Colonies which are situated in the tropics. The point is made that physicians can supply the necessary advice and that sanitary measures can often be applied satisfactorily by laymen. The book has been written to interest laymen in these problems and to show what they might do and how they might profit by applying the recommendations contained therein. The development of the tropics is in their hands and Blacklock's thesis deserves their consideration.

Injuries of the Eye—Diagnosis and Treatment, Forensic Procedures and Visual Economics. By DR. HARRY V. WÜRDEMANN. Second Edition, published by the C. V. Mosby Co., St. Louis. Price $13.50.

The second edition of Würdemann's "Injuries of the Eye" follows the first edition after a twenty-one year interval, and reflects the experiences of the author covering 42 years of practice. The text fills 900 pages, carries interesting abstracts of case histories in smaller type, and is enhanced by 236 illustrations and 10 plates in color. The subject matter is conveniently divided into three sections: Part I, General Injuries; Part II, Injuries of the Special Structures of the Eye; and Part III, Forensic Medicine dealing with medicolegal aspects, workmen's compensation, and visual economics.

Part I includes a discussion of the diagnosis, complications, and treatment of injuries from force applied externally to the eye, from penetrating foreign bodies, from industrial accidents, from radiant energy, and from chemical burns and other causes. Special chapters are devoted to methods of removal of foreign bodies from the eyeball and the socket, to prophylaxis of eye injuries, to plastic surgery of the eyelids and the socket, and to prostheses.

Part II contains a helpful discussion of the ways to handle injuries to the various structures of the eye, and includes separate chapters for each of the following: conjunctiva, cornea, sclera, uvea, lens, vitreous, retina, intracranial visual mechanism, eyelids, orbit, ocular muscles, and lacrymal apparatus.

The book is not offered as a text, but as a work of reference, and as such it would scarcely warrant condensation. There are many citations to the literature, arranged at the end of each chapter, and there is an excellent index. The author and the publishers are to be congratulated upon the presentation of the best book in the English language dealing with injuries of the eye.

One Hour of Medical History. Vol. II. By BENJAMIN SPECTOR, M.D., Associate Professor of Anatomy, Tufts College Medical School. The Beacon Press, Inc., Boston.

This fascinating little volume presents the account of a medical pageant prepared by Dr. Spector and enacted by students of Tufts College Medical School at the Boston Medical Library in 1932. The pageant consists of thirteen parts, showing the evolution of medicine from the simple to the complex.

The first is a playlet on Babylonian-Assyrian medicine, showing a priestess and student priestess at the bedside of a patient; the tenth is a dramatization of the familiar first demonstration of anesthesia. The others, in order, consisting of descriptive monologues, depict the personalities of Moses, Galen, Avicenna, Leonardo da Vinci, Paracelsus, Antonj van Leeuwenhoek, John Hunter, Claude Bernard, Florence Nightingale, Elizabeth Blackwell and Marie Sklodowska Curie.

BOOKS RECEIVED FOR REVIEW

Alcohol and Man. The Effects of Alcohol on Man in Health and Disease. Edited by Haven Emerson. Published by The Macmillan Company. 451 Pages. Price $3.50.

Practical Obstetrics for Students and Practitioners by P. Brooke Bland. Assisted by Thaddeus L. Montgomery. Published by F. A. Davis Company. 730 Pages. Price $8.00.

An Introduction to Dermatology by Norman Walker. Assisted by G. H. Percival. Ninth Edition. Published by William Wood & Co. 382 Pages. Price $7.00.

The Mechanism of Creative Evolution by C. C. Hurst. Published by The Macmillan Company and at the University Press, Cambridge, England. 365 Pages. Price $6.00.

A Manual of Embryology by J. Ernest Frazer. Published by William Wood & Co. 486 Pages. Price $8.00.

An Empire Problem: The House and Village in the Tropics by D. B. Blacklock. Published by The University Press of Liverpool. 100 Pages. Price 3/6 net.

Outline of Preventive Medicine for Medical Practitioners and Students. Prepared under the auspices of the Committee on Public Health Relations, New York Academy of Medicine. 24 Contributors. Second Edition. Published by Paul B. Hoeber, Inc. 462 Pages. Price $5.00.

The Early Diagnosis of the Acute Abdomen by Zachary Cope. Sixth Edition. Published by Humphrey Milford, Oxford University Press. 248 Pages. Price $3.25.

Streptococci in Relation to Man in Health and Disease by Anna W. Williams. Published by The Williams & Wilkins Company. 260 Pages. Price $5.00.

Diseases of the Nose, Throat and Ear. Edited by A. Logan Turner with the collaboration of others. Third Edition. Published by William Wood & Co. 465 Pages. Price $6.00.

Physical Chemistry for Students of Biology and Medicine by David Ingersoll Hitchcock. Published by Charles C. Thomas. 182 Pages. Price $2.75.

The Gold-Headed Cane by William Macmichael. Edited with explanatory and illustrative notes and an essay on William Macmichael, M.D., his life, his works and his editors by Herbert Spencer Robinson. Published by Froben Press, Inc. 223 Pages. Price $3.50.

Non-Tropical Sprue. A Study in Idiopathic Steatorrhoea by Th. E. Hess Thaysen. Published by Levin & Munksgaard and Humphrey Milford, Oxford University Press. 258 Pages.

MEETING NOTICE

JOINT MEETING OF THE GREATER BOSTON MEDICAL SOCIETY AND THE BETH ISRAEL HOSPITAL

There will be a joint meeting of the Greater Boston Medical Society and the Beth Israel Hospital on Tuesday, March 7, at 8:15 P.M., at the Beth Israel Hospital.

Program: "The Importance of Dealing Quantitatively with Water in the Study of Disease." L. H. Newburgh, M.D., Ann Arbor, Michigan. Discussion: T. M. Carpenter, Ph.D., Carnegie Nutrition Laboratory, Boston; Dorothy Rourke Gilligan, M.S., Medical Research Laboratory, Beth Israel Hospital; Samuel A. Levine, M.D., Boston.

BERNARD I. GOLDBERG, M.D., *Secretary.*